

Simultaneous Cabin and Ambient
Ozone Measurements on Two
Boeing 747 Airplanes
Volume III—October 1978 to July 1979

James D. Holdeman
Lewis Research Center
Cleveland, Ohio

and

William H. Jasperson
Control Data Corporation
Minneapolis, Minnesota

February 1985



SIMULTANEOUS CABIN AND AMBIENT OZONE MEASUREMENTS ON TWO BOEING 747 AIRPLANES

VOLUME III - OCTOBER 1978 TO JULY 1979

James D. Holdeman
National Aeronautics and Space Administration
Lewis Research Center
Cleveland, Ohio

and

William H. Jasperson
Control Data Corporation
Minneapolis, Minnesota

INTRODUCTION

Measurements of ozone concentration in the cabins of airline-operated Boeing 747SP and 747-100 airliners are tabulated and plotted along with simultaneous measurements of ambient atmospheric ozone concentrations when available.

The possibility of high concentrations of ozone in the cabins of commercial aircraft is of concern to both flight crews and passengers as well as industry and government organizations. A study of the medical effects of ozone is given in reference 1, and the Federal Aviation Administration has published regulations on cabin ozone concentrations in transport category airplanes (refs. 2 and 3). Further discussion of either the medical or regulatory aspects of this problem is beyond the scope of the present report.

At the time that the cabin ozone problem first attracted public attention in the winter of 1976-77, the NASA Global Atmospheric Program (GASP) was obtaining measurements of atmospheric trace constituents, including ozone, using automated sampling systems on board four Boeing 747 airliners in routine commercial service (refs. 4 and 5). Two of these airplanes were equipped in March 1977 for measurement of cabin ozone in addition to ambient ozone. A 747-100 airliner operated by United Airlines (N4711U) obtained data over the contiguous United States and to Hawaii, and a 747SP aircraft of Pan American World Airways (N533PA) acquired data on many international routes. Analyses of cabin and/or ambient (atmospheric) ozone measurements from GASP-equipped 747 airliners have been reported in references 6 to 16.

Flight listings and plots of all GASP cabin and simultaneous cabin and ambient ozone data are being published in a three-volume series of which this is the third and final volume. These reports permit a detailed evaluation of cabin ozone measurements, including frequency, magnitude, and geographical location, made on two B747 airplanes during routine commercial operations. GASP flights from March to December 1977 are given in volume I (ref. 17), and flights from January to October 1978 appear in volume II (ref. 18). This report (volume III) includes all GASP cabin ozone data collected from October 1978 until the last GASP system was deactivated in July 1979.

*Work partly supported by FAA through interagency agreement DOT-FA78WAI-893.

MEASUREMENT SYSTEM

Ozone was measured on GASP-equipped aircraft by commercially available ultraviolet adsorption photometers (Dasibi Environmental Corp.), which had been modified and repackaged to operate unattended in the airborne environment. The location of the ozone measurement parts, both inside and outside the 747 cabin, are shown in figures 1 and 2.

The GASP ozone measurement system is described in some detail in volume II (ref. 18), which includes discussions of ambient air-sample pressurization, in-flight instrument checks and calibration, data acquisition system, and data reduction procedures. The acceptability criteria, which were adopted for GASP ozone data, required that, on recalibration after its removal from an aircraft, an instrument be within 10 percent of the standard instrument against which it was originally calibrated. Data from instruments which were near or exceeded this limit are identified with tags in the GASP data files (ref. 19) and in the tabulations herein, as they were in references 16 and 17.

Additional information on the ozone measurements system and discussions of GASP measurements of light-scattering particles, water vapor, carbon monoxide, and condensation nuclei are given in reference 19 and the individual instrument reports referenced therein.

PRESENTATION OF DATA

All GASP data, including the cabin and ambient ozone data are available to the public on magnetic computer tape from the National Climatic Center, Federal Building, Asheville, North Carolina 28801. The GASP data tapes and their contents by aircraft, date, and reported measurements are listed in table I. The data plotted and tabulated in this volume are from tapes VL0021, -22, and -27 to -31. The routes, dates, and measurements for each flight are given in appendix A. (Although tapes VL0023 to -26 from aircraft N655PA and VH-EBE do not include cabin ozone data, the flights on these tapes are listed here for completeness). Table II gives the geographical locations corresponding to the airport/city codes which identify the flights in appendix A.

Flight Data Plots

Plots of GASP ozone data for all flights of aircraft N533PA and N4711U are given in appendixes B and C. An example, for a 747SP flight from Tokyo to New York in March 1979, is shown in figure 3. In the plots for each flight, the upper panel gives the altitude (boxes) and latitude (crosses); the center panel gives the ambient (boxes) and cabin (crosses) ozone concentrations, and the lower panel gives the cabin to ambient ozone ratio. This ratio is not plotted for ambient ozone levels below 0.1 ppmv. Data are plotted at the multiple of 5 min nearest to their elapsed time. The data points are not connected if the time interval between points is greater than 10 min.

Microfiche Flight Data Tabulations

Data tabulations for the flights shown in appendixes B and C are given on the microfiche included herein as appendix D. In addition to the tabulated

data the microfiche listings include a line printer plot of the cabin and/or ambient ozone data obtained during each flight.

An example of these tabulations is given in figure 4, which corresponds to the flight shown in figure 3. Each table has a header where the departure and arrival airports are identified by the standard three-letter airport code (table II), and the departure date and aircraft number are given. The remainder of the heading is self-explanatory, although special cases arise: asterisks are entered for the maximum ratio value if no ambient ozone measurements were greater than 0.1 ppmv, and asterisks are entered for both the maximum ambient ozone value and the maximum ratio if no ambient ozone measurement were made during the flight.

In the tables ETIM is the elapsed time from the first data record in the flight. RATIO is the cabin ozone concentration divided by the ambient ozone concentration. If any variable is missing, its place in the table is left blank. During the data reduction, any observation made less than 5 min after the previously acceptable observation was discarded to achieve a minimum time interval between observations of 5 min. If two or more observations were made during the same minute, they were averaged and an "A" is entered next to the GMT. If the GMT was not available for any observation, the elapsed time between observations was computed from the aircraft speed and distance between the data points for all following observations on the flight. The GMT for each observation was then computed by adding the elapsed time to the GMT of the previous observation. In these cases an "M" is entered in the table adjacent to the GMT, unless two or more observations have the same GMT, in which case the "A" tag has precedence.

During the period of the data reported herein, a charcoal filter was installed on aircraft N533PA. These measurements are identified by an "F" tag to the right of the ratio values. There were no ozone reduction techniques used on aircraft N4711U during any GASP measurement period.

The instrument for measuring cabin ozone levels on N4711U (installed on September 20 and removed on December 15, 1978) was reading 8 percent low when recalibrated. The cabin ozone data for all flights of file 1 and for flights 1 to 16 of file 2 (tape VL0021) are from this instrument and are identified by an "L" tag next to the RATIO values in appendix D. A correction equation consistent with the suspected gradual degradation of the ozone scrubber in the instrument is suggested in reference 17. The data plotted and tabulated in this report are "as obtained"; that is, they have not been corrected using this or any other relationship.

The header on the microfiche identified the GASP tape and airplane from which the data originated. The flight routes and dates for each tape are given in appendix A.

CONCLUDING REMARKS

Measurements of ozone concentrations both inside and outside the cabin of two Boeing B747 airplanes in routine commercial service are plotted and tabulated in this report. These data were taken at 5- to 10-min intervals by automated instrumentation as part of the NASA Global Atmospheric Sampling Program

(GASP). All cabin and ambient ozone data obtained by GASP-equipped airliners N533PA and N4711U from October 1978 to July 1979 are presented in this volume.

REFERENCES

1. Higgins, E.A. et al.: Effects of Ozone on Exercising and Sedentary Adult Men and Women Representing the Flight Attendant Population. FAA-AM-79-20, U.S. Dept. of Transportation, Oct. 1979.
2. Airplane Cabin Ozone Contamination. Final Rule. Federal Register, vol. 45, no. 14, Jan. 21, 1980, pp. 3880-3883.
3. Transport Category Airplanes Cabin Ozone Concentrations. FAA Advisory Circular AC 120-38, U.S. Dept. of Transportation, 1980.
4. Perkins, Porter J.; and Gustafsson, R.C.: An Automated Atmospheric Sampling System Operating on 747 Airliners. NASA TM X-71790, 1975.
5. Perkins, Porter J.; and Papathakos, Leonidas C.: Global Sensing of Gaseous and Aerosol Trace Species Using Automated Instrumentation on 747 Airliners. NASA TM X-73810, 1977.
6. Perkins, Porter J.; Holdeman, J.D.; and Gauntner, Daniel J.: Aircraft Cabin Ozone Measurements on B747-100 and B747-SP Aircraft - Correlations with Atmospheric Ozone and Ozone Encounter Statistics. NASA TM X-79060, 1978.
7. Perkins, Porter J.; and Briehl, Daniel: Simultaneous Measurements of Ozone Outside and Inside Cabins of Two B-747 Airliners and a Gates Learjet Business Jet. NASA TM X-78983, 1978.
8. Ozone Contamination in Aircraft Cabins. NASA CP-2066, 1978.
9. Holdeman, James D.: Procedures for Estimating the Frequency of Commercial Airline Flights Encountering High Cabin Ozone Levels. NASA TP-1560, 1979.
10. Holdeman, James D.; and Nastrom, Gregory D.: Analysis of Atmospheric Ozone Levels at Commercial Airplane Cruise Altitudes in Winter and Spring 1976-77. NASA TP-1807 (FAA-EE-81-1), 1980.
11. Nastrom, Gregory D.; and Holdeman, James D.: Tabulations of Ambient Ozone Data Obtained by GASP Airliners, March 1975 to December 1977. NASA TM-81528 (FAA-EE-80-43), 1980.
12. Nastrom, Gregory D.; Holdeman, James D.; and Perkins, Porter J.: Measurements of Cabin and Ambient Ozone on B-747 Airplanes. J. Aircraft, vol. 17, no. 4, Apr. 1980, pp. 246-249.
13. Holdeman, J.D.; and Nastrom, G.D.: Ozone Contamination in Aircraft Cabins: Results from GASP Data and Analysis. NASA TM-81671 (AIAA Paper 81-0305), 1981.

14. Jasperson, William H.; and Holdeman, James D.: Tabulations of Ambient Ozone Data Obtained by GASP (Global Air Sampling Program), Airliners; March 1975 to July 1979. NASA TM-82742 (FAA-EE-83-12), 1984.
15. Jasperson, W.H.; and Wilcox, R.W.: Tabulations of Ozonesonde Data: 1963-1980. NASA CR-174631 (FAA-EE-83-13), 1984.
16. Jasperson, William H.; Nastrom, Gregory D.; and Holdeman, James D.: Climatology of Ozone at Altitudes from 19 000 to 59 000 Feet Based on Combined GASP and Ozonesonde Data. NASA TP-2303, 1984.
17. Perkins, Porter J.; Holdeman, J.D.; and Nastrom, G.D.: Simultaneous Cabin and Ambient Ozone Measurements on Two Boeing 747 Airplanes - Volume I. NASA TM-79166 (FAA-EE-79-05), 1979.
18. Holdeman, James D.; Papathakos, Leonidas C.; Higgins, Glenn J.; and Nastrom, Gregory D.: Simultaneous Cabin and Ambient Ozone Measurements on Two Boeing 747 Airplanes. Volume II - January to October 1978. NASA TM-81733 (FAA-EE-83-7), 1984.
19. Papathakos, Leonidas C.; and Briehl, Daniel: NASA Global Atmospheric Sampling Program (GASP) Data Report for Tapes VL0015, VL0016, VL0017, VL0018, VL0019, and VL0020. NASA TM-81661, 1981.

TABLE I. - GASP DATA ON TAPES VL0001 TO VL0031

Tape	File	Aircraft	Dates	Number of flights	Number of records	Data (a)
VL0001	1	N655PA	03/11/75 - 03/30/75	43	1919	O
VL0002	1	N4711U	03/23/75 - 10/21/75	159	7274	O,W1
VL0003	1	N655PA	05/02/75 - 05/30/75	49	2173	O
VL0004	1	N4711U	12/26/75 - 03/07/76	73	3572	O,W1,F
	2	N655PA	01/22/76 - 03/25/76	66	3757	O,F,B
VL0005	1	N4711U	03/29/76 - 05/29/76	100	4892	O,W1
	2	N655PA	03/25/76 - 05/13/76	86	4716	O,B
	3	N533PA	04/13/76 - 06/13/76	28	2640	O,B
VL0006	1	N655PA	07/11/76 - 09/26/76	131	8724	O,F,B
	2	N533PA	07/08/76 - 09/14/76	45	3594	O,B
	3	VH-EBE	07/13/76 - 08/31/76	69	3977	O
VL0007	1	N712NA	10/28/76 - 11/18/76	14	3481	O
	2	N4711U	11/27/76 - 12/30/76	75	3756	O,F
	3	N533PA	09/30/76 - 01/02/77	146	13773	O,W1
VL0008	1	N655PA	10/15/76 - 01/10/77	165	10122	F
	2	VH-EBE	09/26/76 - 01/09/77	286	15525	
VL0009	1	N533PA	10/28/77 - 10/29/77	1	9162	O,C,A,P,Z
	2	N533PA	10/29/77 - 10/29/77	1	8890	O,C,A,P,Z
	3	N533PA	10/29/77 - 10/30/77	1	11487	O,C,A,P,Z
	4	N533PA	10/30/77 - 10/31/77	1	9640	O,C,A,P,Z
VL0010	1	N533PA	01/21/77 - 04/03/77	66	6586	O,W1,P
	2	N533PA	04/06/77 - 05/31/77	99	7355	O,C,P,Z
	3	N533PA	06/01/77 - 06/02/77	2	3633	O,C,P,Z
	4	N533PA	06/03/77 - 08/12/77	96	10643	O,C,P,Z
	5	N533PA	08/13/77 - 10/04/77	73	7875	O,C,P
VL0011	1	VH-EBE	01/10/77 - 02/28/77	127	6341	O,P
	2	VH-EBE	03/15/77 - 04/23/77	120	6807	O,C
	3	VH-EBE	04/24/77 - 06/18/77	144	6381	O,C
	4	VH-EBE	06/18/77 - 08/12/77	131	6264	O,C
	5	VH-EBE	08/15/77 - 10/02/77	124	6094	O,C
VL0012	1	N4711U	01/03/77 - 03/25/77	49	2181	O,F
	2	N4711U	03/26/77 - 06/13/77	102	4669	O,C,Z,F
	3	N4711U	06/14/77 - 07/26/77	93	4418	C,Z
	4	N4711U	07/27/77 - 09/20/77	110	4394	F
VL0013	1	N655PA	02/22/77 - 04/09/77	84	4058	
	2	N655PA	04/15/77 - 06/14/77	126	6084	O,C
	3	N655PA	06/14/77 - 07/08/77	73	3321	O
	4	N655PA	07/08/77 - 09/01/77	119	5555	F
	5	N655PA	09/02/77 - 10/05/77	74	3273	F
VL0014	1	N533PA	10/04/77 - 01/03/78	109	9718	O,W2,C,P,A,Z
	2	N4711U	11/06/77 - 01/05/78	138	5836	C,A,Z,F
	3	N655PA	10/05/77 - 12/18/77	99	4824	O,C,P,F
	4	VH-EBE	10/03/77 - 11/19/77	96	4334	O,C
	5	VH-EBE	11/20/77 - 01/04/78	120	5931	O,W2,C
VL0015	1	N533PA	01/08/78 - 03/01/78	81	9069	O,W2,C,P,A,Z
	2	N533PA	03/02/78 - 05/03/78	81	10895	O,W2,C,P,A,Z
	3	N533PA	05/04/78 - 06/21/78	84	8035	O,W2,P,A,Z

^aConstituent measurements: A - Condensation nuclei; B - Sample bottle data; C - Carbon monoxide; F - Filter exposure; H - Cabin humidity; O - Ambient ozone; P - Particles and/or clouds; W1 - Aluminum oxide hygrometer; W2 - Cooled mirror hygrometer; Z - Cabin ozone.

TABLE I. - Concluded

Tape	File	Aircraft	Dates	Number of flights	Number of records	Data (a)
VL0016	1	N533PA	06/22/78 - 08/14/78	111	9010	O,W2,Z
	2	N533PA	08/15/78 - 10/05/78	102	9734	O,W2,Z
VL0017	1	N4711U	01/05/78 - 03/20/78	160	14822	O,W2,F,C,Z
	2	N4711U	03/22/78 - 05/08/78	79	5932	O,W2,F,C,A,Z
	3	N4711U	05/08/78 - 06/23/78	108	9046	O,W2,F,C,P,A,Z
VL0018	1	N4711U	06/23/78 - 08/11/78	123	9046	O,W2,F,C,P,A,Z
	2	N4711U	08/11/78 - 10/06/78	70	5997	O,W2,F,C,P,A,Z
VL0019	1	VH-EBE	01/05/78 - 03/04/78	160	9148	O,W2,C,A
	2	N655PA	01/09/78 - 03/06/78	82	3860	O,W2,F,C,A
	3	N655PA	03/06/78 - 05/02/78	128	6591	O,W2,F,C
VL0020	1	N655PA	05/16/78 - 06/12/78	67	4158	O,W2,F,C,P,A
	2	N655PA	06/13/78 - 07/27/78	134	8225	O,F,C,P,A
	3	N655PA	07/28/78 - 10/09/78	162	8226	O,W2,F,C,P,A
VL0021	1	N533PA	10/05/78 - 12/27/78	130	11770	O,W2,Z,H
	2	N533PA	12/28/78 - 02/22/79	96	10097	O,Z,H
	3	N533PA	02/24/79 - 05/10/79	75	8187	O,Z,H
VL0022	1	N533PA	05/31/79 - 06/30/79	29	33365	O,X,H
VL0023	1	N655PA	10/10/78 - 12/04/78	126	7904	O,W2,F,C,P,A
VL0024	1	N655PA	12/06/78 - 02/23/79	151	26872	O,W2,C,P,A
VL0025	1	N655PA	02/24/79 - 03/09/79	29	30449	O,W2,C,P,A
VL0026	1	N655PA	03/13/79 - 05/08/79	132	7184	O,W2,C,P,A
	2	N655PA	05/09/79 - 06/07/79	85	4450	O,W2,C,P
VL0027	1	N4711U	10/07/78 - 12/07/78	90	31082	O,W2,F,C,P,A,Z
VL0028	1	N4711U	12/08/78 - 01/29/79	106	28214	O,W2,F,C,P,A,Z
VL0029	1	N4711U	01/30/79 - 03/14/79	97	26487	O,W2,F,C,P,Z
VL0030	1	N4711U	03/14/79 - 04/07/79	48	19520	O,W2,P,Z
VL0031	1	N4711U	05/29/79 - 07/12/79	106	24138	O,W2,F,P,Z

^aConstituent measurements: A - Condensation nuclei; B - Sample bottle data; C - Carbon monoxide; F - Filter exposure; H - Cabin humidity; O - Ambient ozone; P - Particles and/or clouds; W1 - Aluminum oxide hygrometer; W2 - Cooled mirror hygrometer; Z - Cabin ozone.

TABLE II. - AIRPORT/CITY CODES

Code	City	Code	City
AMS	Amsterdam, The Netherlands	JFK	New York, New York
AKL	Auckland, New Zealand	KHI	Karachi, Pakistan
ATH	Athens, Greece	LAS	Las Vegas, Nevada
BAH	Bahrain, Saudi Arabia	LAX	Los Angeles, California
BGR	Belgrade, Yugoslavia	LHR	London, England
BKK	Bangkok, Thailand	LPA	Los Palmas, Canary Islands
BOM	Bombay, India	MIA	Miami, Florida
BOS	Boston, Massachusetts	MEL	Melbourne, Australia
BRU	Brussels, Belgium	MEX	Mexico City, Mexico
CCS	Caracas, Venezuela	MUC	Munich, West Germany
CLE	Cleveland, Ohio	MNL	Manila, The Philippines
CPH	Copenhagen, Denmark	NAN	Nandi, Fiji
CPT	Cape Town, South Africa	NRT	Tokyo, Japan
CTS	Sapporo, Japan	OKA	Okinawa
CUN	Cancun, Mexico	ORD	Chicago, Illinois
DEL	New Delhi, India	OSA	Osaka, Japan
DEN	Denver, Colorado	PDX	Portland, Oregon
DFW	Dallas/Fort Worth, Texas	PHL	Philadelphia, Pennsylvania
DHA	Dharhain, Saudi Arabia	PIK	Pickwick, Scotland
DTW	Detroit, Michigan	PPG	Pago Pago, Samoa
EZE	Buenos Aires, Argentina	PPT	Papeete, Tahiti
FCO	Rome, Italy	PTY	Panama City, Panama
FAI	Fairbanks, Alaska	SEA	Seattle, Washington
FRA	Frankfurt, West Germany	SFO	San Francisco, California
GIG	Rio de Janeiro, Brazil	SIN	Singapore
GUA	Guatemala City, Guatemala	SNN	Shannon, Ireland
GUM	Guam	SYD	Sydney, Australia
HKG	Hong Kong	THR	Teheran, Iran
HND	Tokyo, Japan	TPE	Taipei, Taiwan
HNL	Honolulu, Hawaii	YQX	Gandor, Newfoundland, Canada
IAD	Washington, D.C.	YYZ	Toronto, Ontario, Canada
IAH	Houston, Texas		
IST	Istanbul, Turkey		
ITO	Hilo, Hawaii		

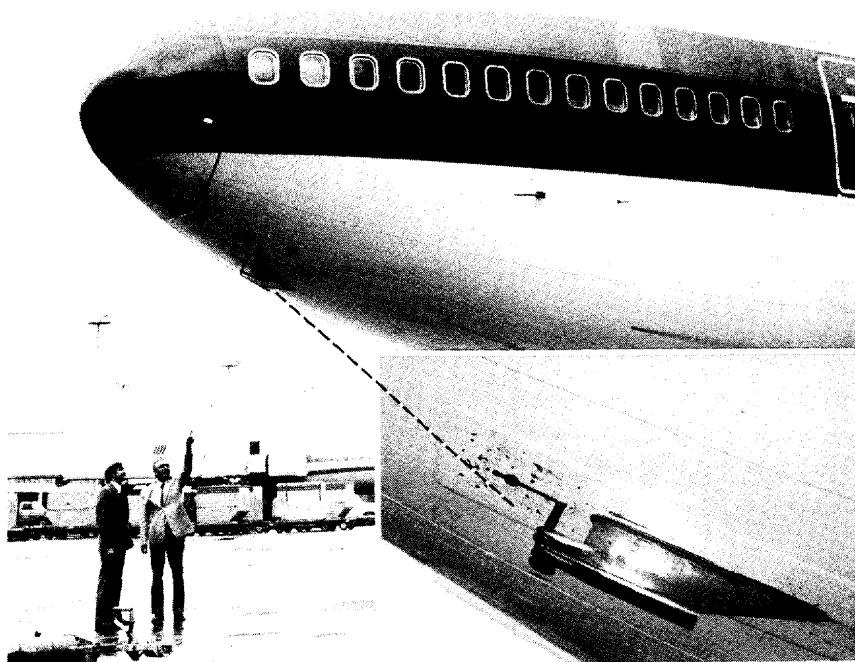


Figure 1. - Air sample inlet probes mounted on 747 airliner equipped for GASP.

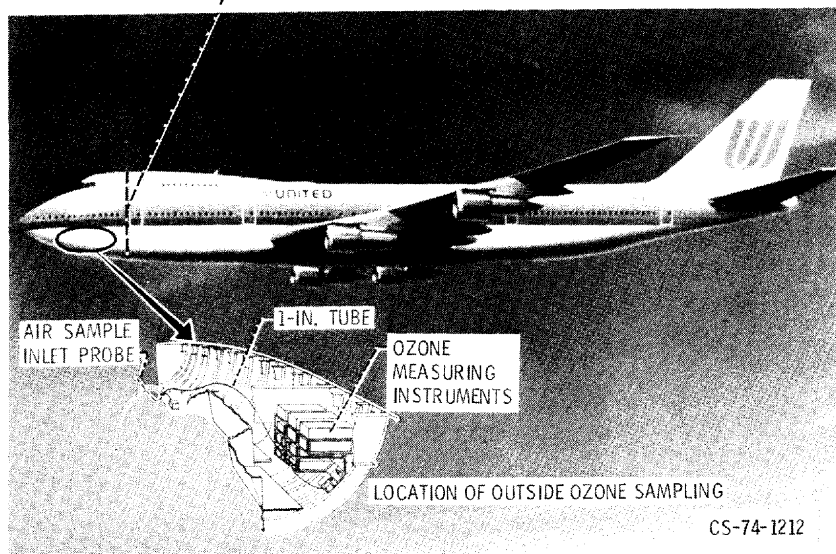
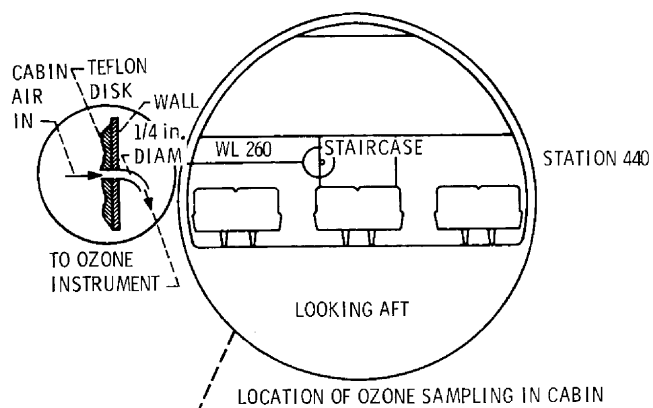


Figure 2. - Ozone measurement locations on B747 airliner.

NRT TO JFK DEPARTURE 2 MAR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 12

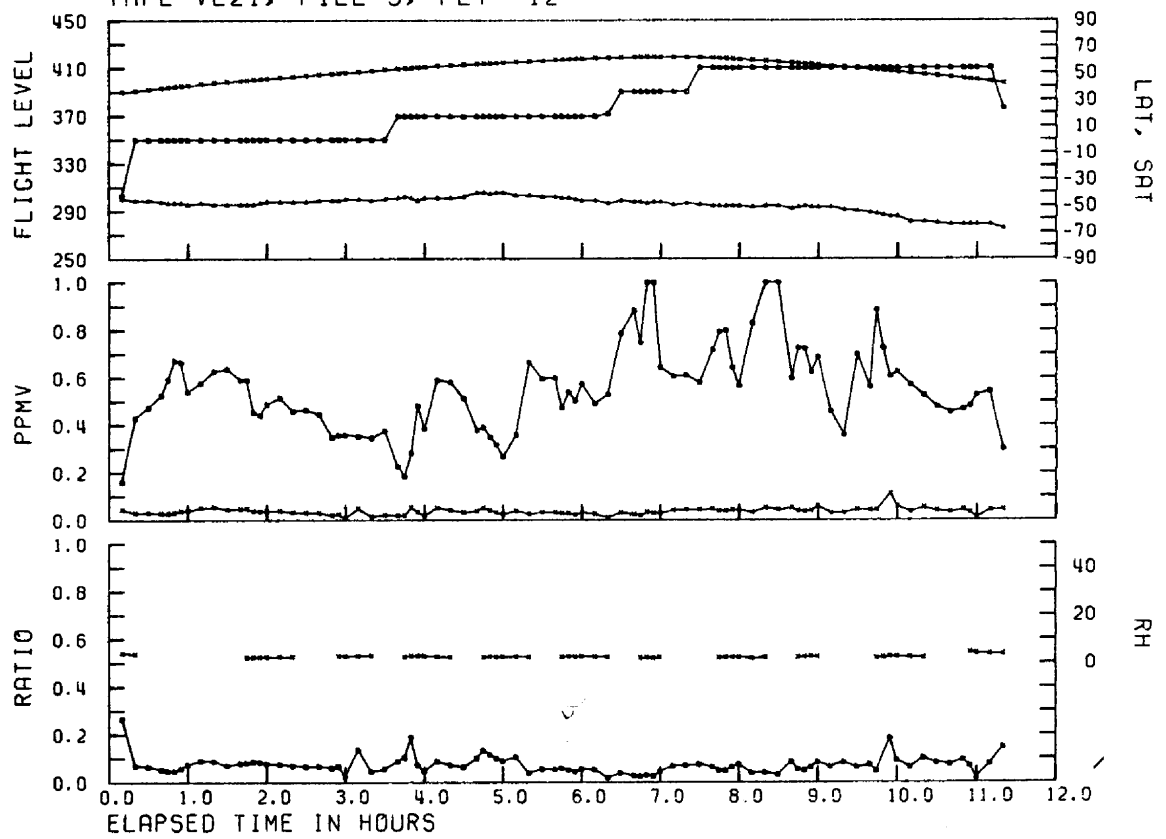


Figure 3. - Example of flight data plots.

NRT TO JFK (PAGE 1 OF 1)

DEPARTURE: 2 MAR 79

AIRCRAFT: PANAM -N533PA

MAXIMUM VALUES: AMBIENT OZONE=1.344 CABIN OZONE=.111 RATIO (LIMITED TO AMB. OZONE ABOVE 0.1)= .27 TOTAL OBS IN CABIN: 87
 DATA SOURCE: GASP TAPE VL021, FILE 3, FLT 12

MO/DA/YR	GMT	ETIM HR:MN	FL	LAT	LONG	TEMP (C)	RH	OZONE(PPMV) CABIN	RATIO AMB.	MO/DA/YR	GMT	ETIM HR:MN	FL	LAT	LONG	TEMP (C)	RH	OZONE(PPMV) CABIN	RATIO AMB.
3/ 2/79	1022	0:10	303	35.92N	142.87E	-45	4	.043	.161	3/ 2/79	1602	5:50	370	60.48N	152.78W	-44	2	.028	.539
3/ 2/79	1032	0:20	350	36.98N	144.00E	-46	3	.030	.429	3/ 2/79	1607	5:55	370	60.70N	151.41W	-45	2	.022	.502
3/ 2/79	1042	0:30	350	38.03N	145.26E	-46		.031	.474	3/ 2/79	1612	6:00	370	60.91N	150.01W	-46	2	.032	.575
3/ 2/79	1052	0:40	350	39.05N	146.57E	-47		.028	.525	3/ 2/79	1622	6:10	370	61.28N	147.16W	-46	2	.026	.491
3/ 2/79	1057	0:45	350	39.54N	147.22E	-48		.028	.592	3/ 2/79	1632	6:20	372	61.59N	144.23W	-48	2	.010	.530
3/ 2/79	1102	0:50	350	40.03N	147.89E	-48		.031	.672	3/ 2/79	1642	6:30	390	61.84N	141.20W	-46		.031	.787
3/ 2/79	1107	0:55	350	40.52N	148.57E	-48		.038	.665	3/ 2/79	1652	6:40	390	62.02N	138.16W	-47		.024	.882
3/ 2/79	1112	1:00	350	40.99N	149.25E	-49		.040	.540	3/ 2/79	1657	6:45	390	62.09N	136.58W	-47	2	.019	.749
3/ 2/79	1122	1:10	350	41.91N	150.67E	-48		.052	.578	3/ 2/79	1702	6:50	390	62.14N	134.98W	-48	2	.033	1.122
3/ 2/79	1132	1:20	350	42.77N	152.15E	-49		.055	.627	3/ 2/79	1707	6:55	390	62.17N	133.39W	-47	2	.029	1.169
3/ 2/79	1142	1:30	350	43.60N	153.66E	-49		.045	.637	3/ 2/79	1712	7:00	390	62.18N	131.90W	-47	2	.029	.644
3/ 2/79	1152	1:40	350	44.39N	155.18E	-49		.047	.591	3/ 2/79	1722	7:10	390	62.16N	128.78W	-49		.041	.607
3/ 2/79	1157	1:45	350	44.78N	155.95E	-49	2	.048	.591	3/ 2/79	1732	7:20	390	62.06N	125.60W	-48		.043	.611
3/ 2/79	1202	1:50	350	45.17N	156.74E	-49	2	.039	.454	3/ 2/79	1742	7:30	410	61.88N	122.41W	-49		.043	.580
3/ 2/79	1207	1:55	350	45.55N	157.54E	-48	2	.037	.442	3/ 2/79	1752	7:40	410	61.53N	119.40W	-50		.046	.718
3/ 2/79	1212	2:00	350	45.92N	158.35E	-47	2	.038	.488	3/ 2/79	1757	7:45	410	61.30N	117.92W	-50	2	.039	.794
3/ 2/79	1222	2:10	350	46.67N	160.01E	-47	2	.039	.515	3/ 2/79	1802	7:50	410	61.05N	116.43W	-50	2	.039	.800
3/ 2/79	1232	2:20	350	47.46N	161.63E	-47	2	.032	.460	3/ 2/79	1807	7:55	410	60.79N	115.01W	-50	2	.041	.643
3/ 2/79	1242	2:30	350	48.21N	163.27E	-47		.031	.465	3/ 2/79	1812	8:00	410	60.51N	113.57W	-50	2	.042	.567
3/ 2/79	1252	2:40	350	48.94N	164.97E	-46		.030	.446	3/ 2/79	1822	8:10	410	59.92N	110.83W	-51	2	.032	.829
3/ 2/79	1302	2:50	350	49.64N	166.73E	-46		.021	.349	3/ 2/79	1832	8:20	410	59.27N	108.18W	-50	2	.051	1.251
3/ 2/79	1307	2:55	350	49.99N	167.63E	-46	3	.024	.358	3/ 2/79	1842	8:30	410	58.57N	105.65W	-50		.043	1.344
3/ 2/79	1312	3:00	350	50.32N	168.55E	-45	3	.009	.359	3/ 2/79	1852	8:40	410	57.83N	103.22W	-52		.051	.599
3/ 2/79	1322	3:10	350	51.02N	170.39E	-45	3	.048	.354	3/ 2/79	1857	8:45	410	57.44N	102.04W	-51	2	.039	.726
3/ 2/79	1332	3:20	350	51.86N	172.15E	-46	3	.016	.347	3/ 2/79	1902	8:50	410	57.04N	100.90W	-50	2	.036	.723
3/ 2/79	1342	3:30	350	52.67N	173.98E	-45		.021	.376	3/ 2/79	1907	8:55	410	56.64N	99.82W	-51	2	.039	.625
3/ 2/79	1352	3:40	370	53.41N	175.98E	-44		.020	.227	3/ 2/79	1912	9:00	410	56.23N	98.72W	-51	2	.058	.687
3/ 2/79	1357	3:45	369	53.76N	176.98E	-43	2	.019	.185	3/ 2/79	1922	9:10	410	55.42N	96.58W	-51		.030	.460
3/ 2/79	1402	3:50	370	54.09N	177.99E	-44	3	.054	.283	3/ 2/79	1932	9:20	410	54.60N	94.54W	-53		.030	.360
3/ 2/79	1407	3:55	370	54.43N	179.03E	-46	3	.035	.482	3/ 2/79	1942	9:30	410	53.73N	92.58W	-54		.044	.699
3/ 2/79	1412	4:00	370	54.77N	179.90W	-44	3	.018	.387	3/ 2/79	1952	9:40	410	52.83N	90.69W	-55		.041	.563
3/ 2/79	1422	4:10	370	55.42N	177.68W	-44	2	.052	.591	3/ 2/79	1957	9:45	410	52.36N	89.77W	-56	2	.042	.886
3/ 2/79	1432	4:20	370	56.00N	175.49W	-44	2	.042	.582	3/ 2/79	2002	9:50	410	51.89N	88.86W	-57	2		.726
3/ 2/79	1442	4:30	369	56.55N	173.15W	-43		.033	.514	3/ 2/79	2007	9:55	410	51.41N	87.98W	-58	2	.111	.607
3/ 2/79	1452	4:40	370	57.05N	170.76W	-40		.038	.380	3/ 2/79	2012	10:00	410	50.93N	87.13W	-58	2	.058	.626
3/ 2/79	1457	4:45	370	57.31N	169.54W	-40	2	.052	.391	3/ 2/79	2022	10:10	410	49.96N	85.47W	-62	2	.036	.573
3/ 2/79	1502	4:50	369	57.56N	168.32W	-41	2	.041	.351	3/ 2/79	2032	10:20	410	48.98N	83.90W	-62	2	.053	.527
3/ 2/79	1507	4:55	370	57.81N	167.07W	-40	2	.032	.319	3/ 2/79	2042	10:30	410	47.97N	82.38W	-63		.039	.479
3/ 2/79	1512	5:00	370	58.05N	165.82W	-40	2	.024	.268	3/ 2/79	2052	10:40	410	46.96N	80.93W	-64		.034	.456
3/ 2/79	1522	5:10	370	58.48N	163.25W	-42	2	.038	.359	3/ 2/79	2102	10:50	410	45.93N	79.54W	-64		.044	.468
3/ 2/79	1532	5:20	370	58.88N	160.61W	-42	2	.026	.664	3/ 2/79	2107	10:55	410	45.40N	78.87W	-64	4	.033	.482
3/ 2/79	1542	5:30	370	59.46N	158.10W	-43		.033	.597	3/ 2/79	2112	11:00	410	44.87N	78.21W	-64	4	.010	.527
3/ 2/79	1552	5:40	370	60.01N	155.45W	-43		.033	.600	3/ 2/79	2122	11:10	410	43.75N	76.94W	-64	3	.042	.543
3/ 2/79	1557	5:45	370	60.25N	154.12W	-44	2	.028	.474	3/ 2/79	2132	11:20	377	42.54N	75.90W	-67	3	.044	.301

Figure 4. - Example of cabin and ambient flight data listing.

APPENDIX A
FLIGHT LISTINGS FOR GASP TAPES

TAPE VL0021, FILE 0001
[Aircraft N533PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)	
1	GP401	SFO-LAX	10/ 5/78	1810-1835	6	O W	Z
2	GP401	LAX-LHR	10/ 5/78	2045-0610	109	O W	Z
3	GP401	LHR-AMS	10/ 6/78	0803-0813	3	O W	Z
4	GP401	AMS-LHR	10/ 6/78	1047-1052	2		
5	GP401	LHR-LAX	10/ 6/78	1352-2341	115	O W	Z
6	GP401	LAX-AKL	10/ 7/78	0605-1820	146	O W	Z
7	GP401	AKL-SYD	10/ 7/78	2040-2250	27	O W	Z
8	GP401	SYD-MEL	10/ 8/78	0104-0139	7	O W	Z
9	GP401	MEL-SYD	10/ 8/78	0304-0333	7	O W	Z
10	GP401	SYD-LAX	10/ 8/78	0525-1738	139	O W	Z
11	GP401	LAX-NRT	10/ 8/78	2241-0841	119	O W	Z
12	GP401	NRT-JFK	10/ 9/78	1101-2206	132	O W	Z
13	GP401	JFK-BAH	10/10/78	2250-1015	208	O W	Z
14	GP401	BAH-BOM	10/11/78	1153-1418	30	O W	Z
15	GP401	BOM-BAH	10/11/78	1704-1934	29	O W	Z
16	GP401	BAH-JFK	10/11/78	2156-1000	145	O W	Z
17	GP401	JFK-BAH	10/12/78	2308-1048	139	O W	Z
18	GP401	BAH-BOM	10/13/78	1220-1445	30	O W	Z
19	GP401	BOM-BAH	10/13/78	1639-1909	31	O W	Z
20	GP401	BAH-JFK	10/13/78	2128-0931	166	O W	Z
21	GP401	JFK-NRT	10/14/78	1559-0443	161	O W	Z
22	GP401	NRT-SFO	10/15/78	0701-1436	89	O W	Z
23	GP401	SFO-LAX	10/15/78	1806-1831	6	O W	Z
24	GP401	LAX-LHR	10/15/78	2108-0604	136	O W	Z
25	GP401	LHR-AMS	10/16/78	0741-0751	3	O W	
26	GP401	AMS-LHR	10/16/78	1055-1105	3	O W	Z
27	GP401	LHR-LAX	10/16/78	1345-0030	129	O W	Z
28	GP401	LAX-LAS	10/17/78	0557-0612	4	O W	
29	GP401	LAS-HNL	10/17/78	0807-1257	58	O W	Z
30	GP401	HNL-SYD	10/17/78	1508-2357	104	O	Z
31	GP401	SYD-AKL	10/18/78	0302-0452	23	O W	Z
32	GP401	AKL-LAX	10/18/78	0701-1807	143	O W	Z
33	GP401	LAX-JFK	10/18/78	2144-0142	63	O W	Z
34	GP401	JFK-NRT	10/19/78	1531-0510	160	O W	Z
35	GP401	NRT-SFO	10/20/78	0722-1502	88	O W	Z
36	GP403	SFO-LAX	10/20/78	1803-1823	5	O W	Z
37	GP403	LAX-LHR	10/20/78	2050-0525	97	O W	Z
38	GP403	LHR-AMS	10/21/78	0747-0757	3	O	Z
39	GP403	AMS-LHR	10/21/78	1042-1052	3	O	Z
40	GP403	LHR-LAX	10/21/78	1340-2335	117	O W	Z
41	GP403	LAX-AKL	10/22/78	0712-1833	134	O W	Z
42	GP403	AKL-SYD	10/22/78	2034-2254	29	O W	Z
43	GP403	SYD-AKL	10/23/78	0250-0450	23	O W	Z
44	GP403	AKL-LAX	10/23/78	0850-2030	135	O W	Z
45	GP403	LAX-NRT	10/24/78	0004-1041	140	O W	Z
46	GP403	NRT-JFK	10/24/78	1342-0037	127	O W	Z
47	GP403	JFK-NRT	10/25/78	1539-0449	153	O W	Z
48	GP403	NRT-SFO	10/26/78	0649-1459	115	O W	Z
49	GP403	SFO-LAX	10/26/78	1805-1830	6	O W	Z
50	GP403	LAX-LHR	10/26/78	2049-0550	106	O W	Z
51	GP403	LHR-AMS	10/27/78	0749-0759	3	O W	Z
52	GP403	AMS-LHR	10/27/78	1045-1100	4	O W	
53	GP403	LHR-LAX	10/27/78	1331-2344	117	O W	Z
54	GP403	LAX-AKL	10/28/78	0805-1956	141	O W	Z
55	GP403	AKL-SYD	10/28/78	2201-0011	27	O W	Z
56	GP403	SYD-LAX	10/29/78	0510-1753	146	O W	Z
57	GP403	LAX-NRT	10/30/78	0016-1052	149	O W	Z
58	GP403	NRT-JFK	10/30/78	1300-2345	124	O W	Z
59	GP403	JFK-LHR	11/ 5/78	1546-2131	68	O W	Z
60	GP403	LHR-JFK	11/ 6/78	1145-1805	74	O W	Z
61	GP403	JFK-EZE	11/11/78	0255-1202	104	O W	Z
62	GP403	EZE-JFK	11/12/78	0304-1220	125	O W	Z
63	GP406	JFK-BAH	11/22/78	2345-1035	126	O W	Z
64	GP406	BAH-BOM	11/23/78	1230-1445	27	O W	Z
65	GP406	BOM-BAH	11/23/78	1734-2027	51	O W	Z

ao denotes ozone; W, water vapor; Z, cabin ozone.

TAPE VL0021, FILE 0001
[Aircraft N533PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)	
66	GP406	BAH-JFK	11/23/78	2254-1159	168	O W	Z
67	GP406	JFK-BAH	11/25/78	0058-1157	126	O W	Z
68	GP406	BAH-BOM	11/25/78	1339-1559	27	O W	Z
69	GP406	BOM-BAH	11/25/78	1736-2026	33	O W	Z
70	GP406	BAH-JFK	11/25/78	2238-1138	145	O W	Z
71	GP406	JFK-NRT	11/26/78	1705-0620	154	O W	Z
72	GP406	NRT-SFO	11/27/78	0814-1605	93	O W	Z
73	GP406	SFO-TPE	11/27/78	2316-1231	156	O W	Z
74	GP406	TPE-HKG	11/28/78	1407-1457	10	O W	Z
75	GP406	HKG-SIN	11/28/78	1607-1902	36	O W	Z
76	GP406	SIN-HKG	11/29/78	0214-0459	63	O W	Z
77	GP406	HKG-LAX	11/29/78	0658-1751	144	O W	Z
78	GP406	LAX-NRT	11/29/78	2133-0853	132	O W	Z
79	GP406	NRT-JFK	11/30/78	1102-2149	145	O W	Z
80	GP421	JFK-BAH	11/30/78	2345-1009	135	O W	Z
81	GP421	BAH-BOM	12/ 1/78	1235-1441	25	O W	
82	GP421	BOM-BAH	12/ 1/78	1736-2036	33	O W	Z
83	GP421	BAH-JFK	12/ 1/78	2246-1141	149	O W	Z
84	GP421	JFK-NRT	12/ 2/78	1655-0632	173	O W	Z
85	GP421	NRT-SFO	12/ 3/78	0909-1645	90	O W	Z
86	GP421	SFO-GUM	12/ 3/78	2321-1006	126	O W	Z
87	GP421	GUM-HKG	12/ 4/78	1151-1508	51	O W	
88	GP421	HKG-SIN	12/ 4/78	1616-1906	33	O W	Z
89	GP421	SIN-HKG	12/ 5/78	0032-0317	33	O W	Z
90	GP421	HKG-LAX	12/ 5/78	0612-1729	137	O W	Z
91	GP421	LAX-NRT	12/ 5/78	2105-0735	143	O W	Z
92	GP421	NRT-JFK	12/ 6/78	1022-2117	142	O W	Z
93	GP421	JFK-BAH	12/ 8/78	0017-1047	124	O W	Z
94	GP421	BAH-BOM	12/ 8/78	1232-1453	28	O W	Z
95	GP421	BOM-BAH	12/ 8/78	1732-2007	30	O W	Z
96	GP421	BAH-JFK	12/ 8/78	2300-1205	150	O W	Z
97	GP421	JFK-NRT	12/ 9/78	1642-0532	148	O W	Z
98	GP421	NRT-SFO	12/10/78	0751-1545	105	O W	Z
99	GP421	SFO-OKA	12/10/78	2325-1200	150	O W	Z
100	GP421	OKA-HKG	12/11/78	1333-1513	20	O W	Z
101	GP421	HKG-SIN	12/11/78	1633-1931	50	O W	Z
102	GP421	SIN-HKG	12/12/78	0042-0322	32	O W	Z
103	GP421	HKG-LAX	12/12/78	0612-1711	165	O W	Z
104	GP421	LAX-NRT	12/12/78	2103-0755	152	O W	Z
105	GP421	NRT-JFK	12/13/78	1021-2127	142	O W	Z
106	GP421	JFK-NRT	12/14/78	1639-0549	155	O W	Z
107	GP421	NRT-SFO	12/15/78	0753-1535	132	O W	Z
108	GP421	SFO-LAX	12/15/78	1910-1934	21	O	Z
109	GP421	LAX-AKL	12/16/78	0701-1933	158	O W	Z
110	GP421	AKL-SYD	12/16/78	2141-2356	28	O W	Z
111	GP421	SYD-LAX	12/17/78	0702-1931	171	O W	Z
112	GP421	LAX-NRT	12/17/78	2350-1050	129	O W	Z
113	GP421	NRT-JFK	12/18/78	1305-2340	116	O W	Z
114	GP421	JFK-BAH	12/19/78	2349-1049	131	O W	Z
115	GP421	BAH-BOM	12/20/78	1232-1447	28	O W	Z
116	GP421	BOM-BAH	12/20/78	1803-2047	33	O W	Z
117	GP421	BAH-JFK	12/20/78	2308-1155	182	O W	Z
118	GP421	JFK-BAH	12/22/78	0009-1050	142	O W	Z
119	GP421	BAH-BOM	12/22/78	1233-1447	43	O W	Z
120	GP421	BOM-BAH	12/22/78	1744-2029	34	O W	Z
121	GP421	BAH-JFK	12/22/78	2244-1058	161	O W	Z
122	GP421	JFK-NRT	12/23/78	1640-0545	153	O W	Z
123	GP421	NRT-SFO	12/24/78	0801-1358	70	O W	Z
124	GP421	SFO-OKA	12/24/78	2308-1108	140	O W	Z
125	GP421	OKA-HKG	12/25/78	1232-1417	22	O W	Z
126	GP421	HKG-SIN	12/25/78	1615-1855	32	O W	Z
127	GP421	SIN-HKG	12/26/78	0032-0320	49	O W	Z
128	GP421	HKG-LAX	12/26/78	0615-1720	134	O W	Z
129	GP421	LAX-NRT	12/26/78	2122-0727	118	O W	Z
130	GP421	NRT-JFK	12/27/78	1015-2139	151	O W	Z

^a0 denotes ozone; W, water vapor; Z, cabin ozone.

TAPE VL0021, FILE 0002
[Aircraft N533PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)	
1	GP415	JFK-LAX	12/28/78	2327-0423	58	O W	Z
2	GP415	LAX-AKL	12/29/78	0716-1917	140	O W	Z
3	GP415	AKL-SYD	12/29/78	2137-2357	29	O W	Z
4	GP415	SYD-AKL	12/30/78	0234-0439	21	O W	Z
5	GP415	AKL-LAX	12/30/78	0654-1803	129	O W	Z
6	GP415	LAX-NRT	12/30/78	2145-0809	118	O W	Z
7	GP415	NRT-JFK	12/31/78	1045-2200	133	O W	Z
8	GP415	JFK-FRA	1/ 1/79	2350-0607	76	O W	Z
9	GP415	FRA-JFK	1/ 2/79	1113-1846	104	O W	Z
10	GP415	JFK-BAH	1/ 2/79	2343-1025	173	O W	Z
11	GP415	BAH-BOM	1/ 3/79	1239-1454	27	O W	Z
12	GP415	BOM-BAH	1/ 3/79	1821-2106	30	O W	Z
13	GP415	BAH-JFK	1/ 3/79	2327-1246	151	O W	Z
14	GP415	JFK-NRT	1/ 4/79	1641-0527	149	O W	Z
15	GP415	NRT-SFO	1/ 5/79	0758-1601	95	O W	Z
16	GP415	SFO-LAX	1/ 5/79	1904-1929	6	O W	Z
17	GP415	LAX-AKL	1/ 6/79	0721-1940	159	O W	Z
18	GP415	AKL-SYD	1/ 6/79	2141-2359	44	O W	Z
19	GP415	SYD-LAX	1/ 7/79	0543-1758	143	O W	Z
20	GP415	LAX-NRT	1/ 7/79	2232-0821	147	O W	Z
21	GP415	NRT-JFK	1/ 8/79	1029-2223	140	O W	Z
22	GP415	JFK-BAH	1/ 9/79	2350-1011	121	O W	Z
23	GP415	BAH-BOM	1/10/79	1223-1428	26	O W	Z
24	GP415	BOM-BAH	1/10/79	1740-2042	36	O W	Z
25	GP415	BAH-JFK	1/10/79	2257-1222	155	O W	Z
26	GP415	JFK-NRT	1/11/79	1627-0521	151	O W	Z
27	GP415	NRT-SFO	1/12/79	0749-1520	226	O W	Z
28	GP415	SFO-LAX	1/12/79	0000-0000M	79	O W	Z
29	GP415	LAX-AKL	1/13/79	0704-1919	143	O W	Z
30	GP415	AKL-SYD	1/13/79	2123-2343	28	O W	Z
31	GP415	SYD-LAX	1/14/79	0513-1644	147	O W	Z
32	GP415	LAX-NRT	1/14/79	2115-0752	123	W	Z
33	GP415	NRT-JFK	1/15/79	1212-2257	124	W	Z
34	GP415	JFK-BAH	1/16/79	2347-1106	131	W	Z
35	GP415	BAH-BOM	1/17/79	1248-1458	26	W	Z
36	GP415	BOM-BAH	1/17/79	1728-2028	36	O W	Z
37	GP415	BAH-JFK	1/17/79	2247-1047	143	O W	Z
38	GP415	JFK-NRT	1/18/79	1639-0609	162	O W	Z
39	GP415	NRT-SFO	1/19/79	0833-1618	91	O W	Z
40	GP420	SFO-LAX	1/19/79	1906-1931	6	O W	Z
41	GP420	LAX-AKL	1/20/79	0703-1915	192	O W	Z
42	GP420	AKL-SYD	1/20/79	2117-2327	25	O W	Z
43	GP420	SYD-LAX	1/21/79	0513-1729	157	O W	Z
44	GP420	LAX-NRT	1/21/79	2057-0721	152	O W	Z
45	GP420	NRT-JFK	1/22/79	1010-2111	135	O W	Z
46	GP420	JFK-NRT	1/23/79	1627-0457	144	O W	Z
47	GP420	NRT-SFO	1/24/79	0755-1548	109	O W	Z
48	GP420	SFO-LAX	1/24/79	1746-1814	21	O W	Z
49	GP420	LAX-SFO	1/24/79	2111-2225	16	O W	Z
50	GP420	SFO-NRT	1/25/79	0105-1040	112	O W	Z
51	GP420	NRT-JFK	1/25/79	1322-0117	170	O W	Z
52	GP420	JFK-NRT	1/26/79	1636-0503	142	O W	Z
53	GP420	NRT-SFO	1/27/79	0757-1611	96	O W	Z
54	GP420	SFO-LAX	1/27/79	1901-1926	6	O	Z
55	GP420	LAX-NRT	1/27/79	2149-0802	118	O W	Z
56	GP420	NRT-JFK	1/28/79	1018-2143	136	O W	Z
57	GP420	JFK-NRT	1/29/79	1640-0310	122	O W	Z
58	GP420	NRT-SFO	1/30/79	0745-1607	145	O W	Z
59	GP420	SFO-LAX	1/31/79	1511-1539	72	O	Z
60	GP420	LAX-NRT	1/31/79	2134-0754	120	O W	Z
61	GP420	NRT-JFK	2/ 1/79	1010-2125	150	O W	Z
62	GP420	JFK-NRT	2/ 3/79	1804-0629	147	O W	Z
63	GP420	NRT-SFO	2/ 4/79	0834-1638	91	O W	Z
64	GP420	SFO-LAX	2/ 4/79	1858-1923	6	O W	Z
65	GP420	LAX-NRT	2/ 4/79	2207-0837	124	O W	Z

²⁰O denotes ozone; W, water vapor; Z, cabin ozone.

TAPE VL0021, FILE 0002
[Aircraft N533PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)		
66	GP420	NRT-JFK	2/ 5/79	1052-2201	130	O	W	Z
67	GP420	JFK-DHA	2/ 7/79	0243-1329	183	O	W	Z
68	GP420	DHA-JFK	2/ 7/79	2134-1018	166	O	W	Z
69	GP420	JFK-NRT	2/ 8/79	1643-0538	152	O	W	Z
70	GP420	NRT-SFO	2/ 9/79	0756-1614	99	O	W	Z
71	GP424	SFO-OKA	2/ 9/79	2214-1018	169	O	W	Z
72	GP424	OKA-HKG	2/10/79	1144-1321	65	O	W	Z
73	GP424	HKG-SIN	2/10/79	1517-1802	33	O	W	Z
74	GP424	SIN-HKG	2/11/79	0031-0311	33	O	W	Z
75	GP424	HKG-SFO	2/11/79	0617-1705	122	O	W	Z
76	GP424	SFO-LAX	2/11/79	2018-2028	3	O		Z
77	GP424	LAX-NRT	2/11/79	2248-0928	124	O	W	Z
78	GP424	NRT-JFK	2/12/79	1140-2224	166	O	W	Z
79	GP424	JFK-DHA	2/14/79	0240-1328	143	O	W	Z
80	GP424	DHA-JFK	2/14/79	2127-0937	143	O	W	Z
81	GP424	JFK-LAX	2/16/79	0008-0503	59	O	W	Z
82	GP424	LAX-AKL	2/16/79	0755-1955	141	O	W	Z
83	GP424	AKL-SYD	2/16/79	2217-0052	30	O	W	Z
84	GP424	SYD-AKL	2/17/79	0529-0724	24	O	W	Z
85	GP424	AKL-LAX	2/17/79	0940-2052	237	O	W	Z
86	GP424	LAX-AKL	2/18/79	0736-1951	142	O	W	Z
87	GP424	AKL-SYD	2/18/79	2144-0012	40	O	W	Z
88	GP424	SYD-AKL	2/19/79	0241-0440	24	O	W	Z
89	GP424	AKL-LAX	2/19/79	0647-1755	145	O	W	Z
90	GP424	LAX-NRT	2/19/79	2052-0717	125	O	W	Z
91	GP424	NRT-SFO	2/20/79	0921-1716	91	O	W	Z
92	GP424	SFO-LAX	2/20/79	1938-1958	5	O	W	Z
93	GP424	LAX-NRT	2/20/79	2200-0810	121	O	W	Z
94	GP424	NRT-JFK	2/21/79	1032-2214	135	O	W	Z
95	GP424	JFK-DHA	2/22/79	0313-1404	146	O	W	Z
96	GP424	DHA-JFK	2/22/79	2120-1005	149	O	W	Z

²⁰O denotes ozone; W, water vapor; Z, cabin ozone.

TAPE VL0021, FILE 0003
[Aircraft N533PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)	
1	GP428	JFK-DHA	2/24/79	0310-1415	129	O W	Z
2	GP428	DHA-JFK	2/24/79	2132-1047	153	O W	Z
3	GP428	JFK-NRT	2/25/79	1716-0542	146	O W	Z
4	GP428	NRT-SFO	2/26/79	0758-1603	89	O W	Z
5	GP428	SFO-LAX	2/26/79	1914-1933	21	O W	Z
6	GP428	LAX-NRT	2/26/79	2150-0805	120	O W	Z
7	GP428	NRT-JFK	2/27/79	0000-0000M	148	O W	Z
8	GP428	JFK-NRT	2/28/79	1625-0455	148	O W	Z
9	GP428	NRT-SFO	3/ 1/79	0755-1547	104	O W	Z
10	GP428	SFO-LAX	3/ 1/79	1816-1842	26	O W	Z
11	GP428	LAX-NRT	3/ 1/79	2100-0722	120	O W	Z
12	GP428	NRT-JFK	3/ 2/79	1012-2137	136	O W	Z
13	GP428	JFK-NRT	3/ 3/79	1634-2154	65	O W	Z
14	GP432	JFK-NRT	4/ 3/79	1628-0513	149	O W	Z
15	GP432	NRT-SFO	4/ 4/79	0000-0000M	88	O W	Z
16	GP432	SFO-LAX	4/ 4/79	1910-1934	4	O W	Z
17	GP432	LAX-NRT	4/ 4/79	2156-0824	216	O W	Z
18	GP432	NRT-JFK	4/ 5/79	1157-2253	131	O W	Z
19	GP432	JFK-NRT	4/ 6/79	1739-0624	149	O W	Z
20	GP432	NRT-SFO	4/ 7/79	0831-1628	109	O W	Z
21	GP432	SFO-HKG	4/ 7/79	2159-1139	175	O W	Z
22	GP432	HKG-SFO	4/ 9/79	0607-1657	126	O W	Z
23	GP433	SFO-OKA	4/ 9/79	2157-1033	148	O W	Z
24	GP433	OKA-HKG	4/10/79	1147-1332	21	O W	Z
25	GP433	HKG-BKK	4/10/79	1514-1709	23	O W	Z
26	GP433	BKK-HKG	4/11/79	0117-0257	20	O W	Z
27	GP433	HKG-SFO	4/11/79	0622-1707	124	O W	Z
28	GP433	SFO-HKG	4/11/79	2217-1149	176	O W	Z
29	GP433	HKG-SIN	4/12/79	1306-1537	39	O W	Z
30	GP433	SIN-HKG	4/13/79	0031-0316	34	O W	Z
31	GP433	HKG-SFO	4/13/79	0709-1818	131	O W	Z
32	GP433	SFO-LAX	4/14/79	0310-0336	6	O W	Z
33	GP433	LAX-AKL	4/14/79	0000-0000M	145	O W	Z
34	GP433	AKL-SYD	4/14/79	2206-0046	30	O W	Z
35	GP433	SYD-LAX	4/15/79	0518-1723	189	O	Z
36	GP433	LAX-JFK	4/15/79	2114-0113	63	O	Z
37	GP433	JFK-NRT	4/16/79	1637-0507	146	O	Z
38	GP433	NRT-SFO	4/17/79	0751-1546	91	O	Z
39	GP433	SFO-LAX	4/17/79	1850-1915	6	O	Z
40	GP433	LAX-NRT	4/17/79	2112-0747	124	O	Z
41	GP433	NRT-JFK	4/18/79	1012-2135	131	O	Z
42	GP433	JFK-DHA	4/19/79	0304-1416	144	O	Z
43	GP433	DHA-JFK	4/19/79	2116-0956	145	O	Z
44	GP436	JFK-DHA	4/21/79	0305-1402	142	O	Z
45	GP436	DHA-JFK	4/21/79	2118-0954	161	O	Z
46	GP436	JFK-NRT	4/22/79	1636-0541	152	O	Z
47	GP436	NRT-SFO	4/23/79	0830-1651	115	O	Z
48	GP436	SFO-LAX	4/23/79	1936-1956	5	O	Z
49	GP436	LAX-AKL	4/24/79	0652-1912	147	O	Z
50	GP436	AKL-SYD	4/24/79	2115-2350	32	O	Z
51	GP436	SYD-AKL	4/25/79	0223-0418	24	O	Z
52	GP436	AKL-LAX	4/25/79	0636-1711	140	O	Z
53	GP436	LAX-NRT	4/25/79	2109-0732	123	O	Z
54	GP436	NRT-JFK	4/26/79	1122-0000	144	O	Z
55	GP436	JFK-NRT	4/27/79	1646-0551	151	O	Z
56	GP436	NRT-SFO	4/28/79	0753-1541	124	O	Z
57	GP436	SFO-NRT	4/29/79	0000-0000M	143	O	Z
58	GP436	NRT-JFK	4/29/79	0000-0000M	134	O	Z
59	GP436	JFK-NRT	4/30/79	1527-0355	175	O	Z
60	GP436	NRT-SFO	5/ 1/79	0000-0000M	92	O	Z
61	GP436	SFO-LHR	5/ 1/79	2102-0551	103	O	Z
62	GP436	LHR-LAX	5/ 2/79	1300-2304	119	O	Z
63	GP436	LAX-AKL	5/ 3/79	0619-1819	154	O	Z
64	GP436	AKL-SYD	5/ 3/79	2157-0022	28	O	Z
65	GP436	SYD-LAX	5/ 4/79	0344-1624	149	O	Z

^aO denotes ozone; W, water vapor; Z, cabin ozone.

TAPE VL0021, FILE 0003
[Aircraft N533PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)	
66	GP436	LAX-NRT	5/ 4/79	2044-0629	115	0	Z
67	GP436	NRT-JFK	5/ 5/79	1018-2122	155	0	Z
68	GP436	JFK-EZE	5/ 6/79	0126-1031	105	0	Z
69	GP436	EZE-JFK	5/ 6/79	1354-2339	117	0	Z
70	GP438	JFK-NRT	5/ 7/79	1641-0516	149	0	Z
71	GP438	NRT-SFO	5/ 8/79	0745-1537	89	0	Z
72	GP438	SFO-LHR	5/ 8/79	2203-0652	102	0	Z
73	GP438	LHR-LAX	5/ 9/79	1352-2349	118	0	Z
74	GP438	LAX-AKL	5/10/79	0702-1914	138	0	Z
75	GP438	AKL-SYD	5/10/79	2118-2345	54	0	Z

^a0 denotes ozone; W, water vapor; Z, cabin ozone.

TAPE VL0022, FILE 0001
[Aircraft N533PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)	
1	GP443	SFO-HKG	5/31/79	2146-1004	143	O W	Z
2	GP443	HKG-SFO	6/ 2/79	0617-1702	128	O W	Z
3	GP443	SFO-HKG	6/ 2/79	2130-1006	145	O W	Z
4	GP443	HKG-SFO	6/ 4/79	0606-1656	126	O W	Z
5	GP443	SFO-HKG	6/ 4/79	2130-1023	166	O W	Z
6	GP443	HKG-BKK	6/ 5/79	1248-1427	41	O W	Z
7	GP443	BKK-HKG	6/ 6/79	0133-0333	22	O W	Z
8	GP443	HKG-SFO	6/ 6/79	0609-1729	172	O W	Z
9	GP443	SFO-LAX	6/ 7/79	1459-1519	5	O W	Z
10	GP443	LAX-NRT	6/ 7/79	2006-0634	136	O W	Z
11	GP443	NRT-JFK	6/ 8/79	1103-2214	192	O W	Z
12	GP443	JFK-NRT	6/ 9/79	2029-0934	158	O W	Z
13	GP443	NRT-SFO	6/10/79	1229-2059	99	O W	Z
14	GP443	SFO-LHR	6/12/79	2108-0535	101	O W	Z
15	GP443	LHR-LAX	6/13/79	1321-2333	119	O W	Z
16	GP443	LAX-AKL	6/14/79	0613-1823	2930	W	Z
17	GP443	AKL-SYD	6/14/79	2100-2319	858	W	Z
18	GP443	SYD-LAX	6/15/79	0307-1523	159	W	Z
19	GP443	LAX-NRT	6/15/79	2024-0650	125	W	Z
20	GP443	NRT-JFK	6/16/79	1029-2159	139	W	Z
21	GP443	JFK-EZE	6/17/79	0221-1127	7582	W	Z
22	GP443	EZE-JFK	6/17/79	1405-2321	4424	W	Z
23	GP443	JFK-NRT	6/18/79	1546-0302	130	W	Z
24	GP444	JFK-NRT	6/26/79	1549-0422	4536	W	Z
25	GP444	NRT-SFO	6/27/79	0656-1515	99	W	Z
26	GP444	SFO-LAX	6/28/79	1643-1708	6	W	Z
27	GP444	LAX-NRT	6/28/79	2123-0742	3624	W	Z
28	GP444	NRT-JFK	6/29/79	1016-2133	6871	W	Z
29	GP444	JFK-DHA	6/30/79	0228-1335	129	W	Z

^a0 denotes ozone; W, water vapor; Z, cabin ozone.

TAPE VL0023, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records		Constituent data (a)
1	GP409	SFO-LHR	10/10/78	0223-1118	103	O	C P A
2	GP409	LHR-JFK	10/10/78	1600-2205	101	O	C P A
3	GP409	JFK-LHR	10/11/78	1506-2051	69	O	C P A
4	GP409	LHR-BRU	10/11/78	2219-2224	2		P
5	GP409	BRU-LHR	10/12/78	0755-0805	3		P
6	GP409	LHR-JFK	10/12/78	1119-1735	72	O	F C P A
7	GP409	JFK-IAH	10/12/78	2355-0220	29	O	C P A
8	GP409	IAH-SFO	10/13/78	1307-1602	36	O	C P A
9	GP409	SFO-NRT	10/13/78	2055-0620	111	O	C P A
10	GP409	NRT-HNL	10/14/78	1239-1814	66	O	C P A
11	GP409	HNL-NRT	10/14/78	2338-0642	84	O	C P A
12	GP409	NRT-HKG	10/15/78	0927-1256	39	O	F C P A
13	GP409	HKG-DEL	10/15/78	1437-2047	74	O	C P A
14	GP409	DEL-THR	10/15/78	2248-0145	32	O	C P A
15	GP409	THR-FRA	10/16/78	0338-0758	48	O	C P A
16	GP409	FRA-LHR	10/16/78	1012-1047	8		P A
17	GP409	LHR-JFK	10/16/78	1324-1943	91	O	C P A
18	GP409	JFK-IAH	10/16/78	2311-0148	47	O	C P A
19	GP409	IAH-JFK	10/17/78	1836-2051	27	O	P A
20	GP409	JFK-LHR	10/18/78	1434-2000	94	O	C P A
21	GP409	LHR-BRU	10/18/78	2157-2202	2		P
22	GP409	BRU-LHR	10/19/78	0755-0805	3		P
23	GP409	LHR-JFK	10/19/78	1050-1715	75	O	C P A
24	GP409	JFK-LHR	10/20/78	0119-0654	80	O	C P A
25	GP409	LHR-SEA	10/20/78	1022-1922	107	O	C P A
26	GP409	SEA-LHR	10/21/78	0146-0921	88	O	F C P A
27	GP409	LHR-SFO	10/21/78	1258-2225	141	O	C P A
28	GP409	SFO-LAX	10/22/78	0448-0508	5	O	C P A
29	GP409	LAX-PPT	10/22/78	0834-1529	94	O	C P A
30	GP409	PPT-PPG	10/23/78	0805-1035	57		C P A
31	GP409	PPG-HNL	10/23/78	1216-1626	48		C P A
32	GP409	HNL-LAX	10/23/78	1939-2354	50	O	C P A
33	GP409	LAX-SFO	10/24/78	0203-0228	6	O	P A
34	GP409	SFO-NRT	10/24/78	2047-0633	114	O W	C P A
35	GP409	NRT-HNL	10/25/78	1232-1834	99	O W	C P A
36	GP409	HNL-PDX	10/25/78	2131-0146	51	O W	C P A
37	GP409	PDX-HNL	10/26/78	1856-2331	54	O W	C P A
38	GP409	HNL-PDX	10/27/78	0145-0552	48	O W	C P A
39	GP409	PDX-HNL	10/27/78	1716-2206	54	O W	C P A
40	GP409	HNL-OSA	10/28/78	0017-0755	106	O W	C P A
41	GP409	OSA-HNL	10/28/78	1041-1717	139	O W	C P A
42	GP409	HNL-NRT	10/29/78	0139-0638	75	O W	C P A
43	GP409	NRT-HKG	10/29/78	0929-1315	57	O W	C P A
44	GP409	HKG-DEL	10/29/78	1531-2019	59	O W	C P A
45	GP409	DEL-THR	10/29/78	2301-0205	37	O W	C P A
46	GP409	THR-FRA	10/30/78	0508-0914	47	O W	C P A
47	GP409	FRA-LHR	10/30/78	1114-1149	8	O W	C P A
48	GP409	LHR-JFK	10/30/78	1435-2055	77	O W	C P A
49	GP409	JFK-IAH	11/ 1/78	0252-0523	28	O W	C P A
50	GP409	IAH-JFK	11/ 1/78	1930-2140	27	O W	C P A
51	GP409	JFK-LHR	11/ 2/78	0049-0603	78	O W	C P A
52	GP409	LHR-FRA	11/ 2/78	0845-0910	6	O W	C P A
53	GP409	FRA-THR	11/ 2/78	1131-1534	96	O W	C P A
54	GP409	THR-BKK	11/ 2/78	1813-2333	65	O W	C P A
55	GP409	BKK-HKG	11/ 3/78	0131-0316	22	O W	C P A
56	GP409	HKG-NRT	11/ 3/78	0533-0813	33	O W	C P A
57	GP409	NRT-LAX	11/ 3/78	1125-1925	166	O W	C P A
58	GP409	LAX-HNL	11/ 4/78	0110-0537	54	O W	C P A
59	GP409	HNL-PPG	11/ 4/78	0755-1220	51	O W	C P A
60	GP409	PPG-PPT	11/ 4/78	1418-1613	22	O W	C P A
61	GP409	PPT-LAX	11/ 5/78	0720-1418	83	O W	C P A
62	GP409	LAX-SFO	11/ 5/78	1702-1727	6	O W	C P A
63	GP409	SFO-NRT	11/ 5/78	2143-0743	116	O W	C P A
64	GP409	NRT-HNL	11/ 6/78	1245-1826	161	O W	C P A
65	GP409	HNL-OSA	11/ 6/78	2345-0727	97	O W	C P A

a0 denotes ozone; W, water vapor; F, filter exposure; C, carbon monoxide;
P, particles and/or clouds; A, condensation nuclei.

TAPE VL0023, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
66	GP409	OSA-HNL	11/ 7/78	1043-1718	79	O W C P A
67	GP409	HNL-LAX	11/ 7/78	2135-0149	68	O W C P A
68	GP409	LAX-JFK	11/ 9/78	0227-0632	48	O W C P A
69	GP409	JFK-ATH	11/ 9/78	0852-1716	99	O W C P A
70	GP409	ATH-BGR	11/ 9/78	2054-0521	100	O W C P A
71	GP409	BGR-LAX	11/10/78	0830-1345	62	O W C P A
72	GP409	LAX-PIK	11/10/78	2247-0652	96	O W C P A
73	GP409	PIK-LHR	11/11/78	0839-0909	7	O W C P A
74	GP409	LAX-HNL	11/12/78	0625-1045	51	O W C P A
75	GP409	HNL-LAX	11/12/78	2059-0114	51	O W C P A
76	GP409	LAX-HNL	11/13/78	0602-1027	49	O W C P A
77	GP409	HNL-AKL	11/13/78	1326-2103	108	O W C P A
78	GP409	AKL-SYD	11/13/78	2333-0153	27	O W C P A
79	GP409	SYD-MEL	11/14/78	0444-0514	7	O W C P A
80	GP409	MEL-SYD	11/14/78	0649-0719	7	O C P A
81	GP409	SYD-NAN	11/14/78	0914-1209	37	O W C P A
82	GP409	NAN-HNL	11/14/78	1401-1906	61	O W C P A
83	GP409	HNL-LAX	11/14/78	2242-0232	46	O W C P A
84	GP409	LAX-LHR	11/15/78	2210-0655	104	O W C P A
85	GP409	LHR-IAD	11/16/78	1200-1915	86	O W C P A
86	GP409	IAD-DTW	11/16/78	2120-2150	37	O W C P A
87	GP409	DTW-IAD	11/16/78	2344-0014	22	O W C P A
88	GP409	IAD-LHR	11/17/78	0218-0748	64	O W C P A
89	GP409	LHR-LAX	11/17/78	1256-2256	114	O W C P A
90	GP409	LAX-LHR	11/18/78	2202-0649	118	O W C P A
91	GP409	LHR-LAX	11/19/78	1243-2256	119	O W C P A
92	GP409	LAX-LHR	11/20/78	2158-0633	102	O W C P A
93	GP409	LHR-JFK	11/21/78	1204-1904	81	O W C P A
94	GP409	JFK-FCO	11/22/78	0121-0801	76	O W C P A
95	GP409	FCO-IST	11/22/78	1025-1155	19	O W C P A
96	GP409	IST-THR	11/22/78	1325-1530	25	O W C P A
97	GP409	THR-KHI	11/22/78	1819-1959	21	O W C P A
98	GP409	KHI-THR	11/23/78	0020-0240	28	O W C P A
99	GP409	THR-IST	11/23/78	0508-0720	42	O W C P A
100	GP409	IST-FCO	11/23/78	0851-1016	18	O W C P A
101	GP409	FCO-JFK	11/23/78	1325-2210	115	O W C P A
102	GP409	JFK-FRA	11/24/78	0159-0755	90	O W C P A
103	GP409	FRA-JFK	11/24/78	1258-2108	107	O W C P A
104	GP409	JFK-FCO	11/25/78	0029-0715	92	O W C P A
105	GP409	FCO-IST	11/25/78	0944-1114	17	O W C P A
106	GP409	IST-THR	11/25/78	1255-1457	41	O W C P A
107	GP409	THR-BOM	11/25/78	1711-1956	33	O W C P A
108	GP409	BOM-THR	11/25/78	2308-0243	42	O W C P A
109	GP409	THR-IST	11/26/78	0519-0719	23	O W C P A
110	GP409	IST-FCO	11/26/78	0857-1027	19	O W C P A
111	GP409	FCO-JFK	11/26/78	1353-2201	110	O W C P A
112	GP409	JFK-FRA	11/27/78	0203-0823	90	O W C P A
113	GP409	FRA-JFK	11/27/78	1047-1817	88	O W C P A
114	GP409	JFK-FCO	11/28/78	0039-0723	112	O W C P A
115	GP409	FCO-IST	11/28/78	0941-1114	57	O W C P A
116	GP409	IST-THR	11/28/78	1300-1450	23	O W C P A
117	GP409	THR-IST	11/29/78	0527-0800	32	O W C P A
118	GP409	IST-FCO	11/29/78	0915-1053	66	O W C P A
119	GP409	FCO-JFK	11/29/78	1353-2223	98	O W C P A
120	GP409	JFK-FRA	11/30/78	0343-0939	104	O W C P A
121	GP409	MUC-SNN	11/30/78	1439-1614	19	O W C P A
122	GP409	SNN-JFK	11/30/78	1823-0023	71	O W C P A
123	GP409	JFK-FRA	12/ 1/78	0512-1051	83	O W C P A
124	GP409	FRA-JFK	12/ 1/78	1418-2146	89	O W C P A
125	GP409	JFK-FCO	12/ 4/78	0051-0717	160	O W C P A
126	GP409	FCO-IST	12/ 4/78	0947-1102	16	O W C P A

^a0 denotes ozone; W, water vapor; F, filter exposure; C, carbon monoxide; P, particles and/or clouds; A, condensation nuclei.

TAPE VL0024, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
1	GP410	JFK-LHR	12/ 6/78	1534-2054	62	O W C P A
2	GP410	LHR-FRA	12/ 7/78	0933-1003	7	O W C P A
3	GP410	FRA-THR	12/ 7/78	1158-1554	78	O W C P A
4	GP410	THR-DEL	12/ 7/78	2322-0152	31	O W C P A
5	GP410	DEL-BKK	12/ 8/78	0346-0631	33	O W C P A
6	GP410	BKK-HKG	12/ 8/78	0807-0937	19	O W C P A
7	GP410	HKG-NRT	12/ 8/78	2302-0143	48	O W C P A
8	GP410	NRT-LAX	12/ 9/78	0342-1157	98	O W C P A
9	GP410	LAX-LHR	12/ 9/78	2324-0858	113	O W C P A
10	GP410	LHR-LPA	12/13/78	1548-1713	17	O W C P
11	GP410	LPA-BGR	12/13/78	2009-0304	142	O W C P
12	GP410	BGR-LAX	12/14/78	0621-1120	57	O W C P
13	GP410	LAX-LHR	12/14/78	2158-0716	125	O W C P
14	GP410	LHR-IAD	12/15/78	1123-1807	125	O W C P
15	GP410	IAD-DTW	12/15/78	2013-2043	7	O W C P
16	GP410	DTW-IAD	12/15/78	2343-0008	6	O C P
17	GP410	IAD-LHR	12/16/78	0000-0000M	68	O W C P
18	GP410	LHR-JFK	12/16/78	1226-1851	73	O W C P
19	GP410	JFK-FCO	12/17/78	0209-0854	129	O W C P
20	GP410	FCO-IST	12/17/78	1131-1250	32	O W C P
21	GP410	IST-THR	12/17/78	1420-1600	20	O W C P
22	GP410	THR-BOM	12/17/78	1911-2144	29	O W C P
23	GP410	BOM-THR	12/17/78	2354-0329	43	O W C P
24	GP410	THR-IST	12/18/78	0544-0817	30	O W C P
25	GP410	IST-FCO	12/18/78	0958-1143	22	O W C P
26	GP410	FCO-JFK	12/18/78	1440-2235	91	O W C P
27	GP410	JFK-FCO	12/20/78	0048-0747	98	O W C P
28	GP410	FCO-IST	12/20/78	1009-1124	14	O W C P
29	GP410	IST-THR	12/20/78	1323-1513	23	O W C P
30	GP410	THR-KHI	12/20/78	1807-1953	23	O W C P
31	GP410	KHI-THR	12/21/78	0028-0233	23	O W C P
32	GP410	THR-IST	12/21/78	0605-0616	3	C P
33	GP410	IST-FCO	12/21/78	0957-1137	21	O W C P
34	GP410	FCO-JFK	12/22/78	0346-1138	87	O W C P
35	GP410	JFK-FCO	12/23/78	0035-0710	76	W P
36	GP410	FCO-IST	12/23/78	1005-1130	18	W P
37	GP410	IST-THR	12/23/78	1308-1458	23	W P
38	GP410	THR-BOM	12/23/78	1719-2009	33	W P
39	GP410	BOM-THR	12/23/78	2251-0212	40	W P
40	GP410	THR-IST	12/24/78	0508-0728	47	W P
41	GP410	IST-FCO	12/24/78	0854-1024	18	W P
42	GP410	FCO-JFK	12/24/78	1322-2115	134	W P
43	GP410	JFK-LHR	12/26/78	0045-0607	99	W P
44	GP410	LHR-FRA	12/26/78	0848-0918	7	W P
45	GP410	FRA-THR	12/26/78	1109-1459	44	W P
46	GP410	THR-DEL	12/26/78	1750-2016	50	W P
47	GP410	DEL-HKG	12/26/78	2236-0311	56	W P
48	GP410	HKG-NRT	12/27/78	0537-0817	32	W P
49	GP410	NRT-LAX	12/27/78	1047-1933	105	W P
50	GP410	LAX-SFO	12/27/78	2234-2259	6	W P
51	GP414	SFO-HNL	12/28/78	0538-0958	49	O W C P A
52	GP414	HNL-GUM	12/28/78	1228-1927	85	O W C P A
53	GP414	GUM-MNL	12/28/78	2207-0038	33	O W C P A
54	GP414	MNL-GUM	12/29/78	0611-0837	29	O W C P A
55	GP414	GUM-HNL	12/29/78	1102-1709	117	O W C P A
56	GP414	HNL-SFO	12/29/78	2057-0034	57	O W C P A
57	GP414	SFO-HNL	12/30/78	0547-1052	58	O W C P A
58	GP414	HNL-GUM	12/30/78	1902-0137	74	O W C P A
59	GP414	GUM-NRT	12/31/78	0345-0620	32	O W C P A
60	GP414	NRT-GUM	12/31/78	0829-1109	33	O W C P A
61	GP414	GUM-HNL	12/31/78	1320-1930	74	O W C P A
62	GP414	HNL-SFO	12/31/78	2153-0131	55	O W C P A
63	GP414	SFO-NRT	1/ 1/79	2145-0700	109	O W C P A
64	GP414	NRT-HNL	1/ 2/78	1221-1736	62	O W C P A
65	GP414	HNL-OSA	1/ 3/79	0021-0848	99	O W C P A

ao denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei.

TAPE VL0024, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)		
66	GP414	OSA-HNL	1/ 3/79	1101-1636	67	O W	C P A	
67	GP414	HNL-NRT	1/ 3/79	2254-0657	109	O W	C P A	
68	GP414	NRT-HKG	1/ 4/79	0928-1318	42	O W	C P A	
69	GP414	HKG-DEL	1/ 4/79	1539-2049	62	O W	C P A	
70	GP414	DEL-IST	1/ 4/79	2334-0509	65	O W	C P A	
71	GP414	IST-FRA	1/ 5/79	0710-0928	42	O W	C P A	
72	GP414	FRA-LHR	1/ 5/79	1343-1416	23	O	C P A	
73	GP414	LHR-JFK	1/ 5/79	1829-0124	80	O W	C P A	
74	GP414	JFK-FCO	1/ 6/79	0620-1250	71	O W	C P A	
75	GP414	FCO-IST	1/ 6/79	1709-1829	17	O W	P A	
76	GP414	IST-BOM	1/ 6/79	2022-0109	159	O W	P A	
77	GP414	BOM-THR	1/ 7/79	0434-0807	42	O W	P A	
78	GP414	THR-IST	1/ 7/79	1005-1240	31	O W	P A	
79	GP414	IST-FCO	1/ 7/79	1427-1557	19	O W	P A	
80	GP414	FCO-YQX	1/ 7/79	2007-0247	77	O W	C P A	
81	GP414	YQX-JFK	1/ 8/79	0615-0830	27	O W	C P A	
82	GP414	JFK-LHR	1/ 8/79	1545-2050	59	O W	C P A	
83	GP414	LHR-JFK	1/ 9/79	1132-1839	83	O W	C P A	
84	GP414	JFK-FRA	1/ 9/79	2355-0528	85	O W	C P A	
85	GP414	FRA-JFK	1/10/79	1106-1846	109	O W	C P A	
86	GP414	JFK-FRA	1/12/79	0201-0741	85	O W	C P A	
87	GP414	FRA-JFK	1/12/79	1305-2040	92	O W	C P A	
88	GP416	SFO-LAX	1/19/79	1558-1621	11			
89	GP416	LAX-GUA	1/19/79	1843-2205	91			
90	GP416	GUA-CCS	1/20/79	0022-0249	69			
91	GP416	CCS-GUA	1/20/79	1152-1437	65			
92	GP416	GUA-LAX	1/20/79	1715-2119	108			
93	GP416	LAX-SFO	1/20/79	2307-2331	13			
94	GP416	SFO-SEA	1/21/79	0249-0345	25			
95	GP416	SEA-PIK	1/21/79	0614-1343	270			
96	GP416	PIK-LHR	1/21/79	1631-1653	11			
97	GP416	LHR-JFK	1/21/79	1935-0159	206			
98	GP416	JFK-IAH	1/22/79	0438-0708	67			
99	GP416	IAH-MEX	1/22/79	0845-0954	31			
100	GP416	MEX-IAH	1/22/79	1655-1808	33			
101	GP416	IAH-JFK	1/22/79	2050-2253	55			
102	GP416	JFK-FRA	1/23/79	0157-0815	218			
103	GP416	FRA-DEL	1/23/79	1336-2101	206			
104	GP416	DEL-HKG	1/23/79	2233-0258	117			
105	GP416	HKG-NRT	1/24/79	0529-0812	80			
106	GP416	NRT-LAX	1/24/79	1046-1925	282			
107	GP416	LAX-SFO	1/24/79	2207-2229	11			
108	GP422	SFO-LAX	1/25/79	1603-1625	10			
109	GP422	LAX-GUA	1/25/79	1915-2236	91			
110	GP422	GUA-PTY	1/26/79	0056-0211	35			
111	GP422	PTY-GIG	1/26/79	0418-1000	144			
112	GP422	GIG-JFK	1/27/79	0232-1113	218			
113	GP422	JFK-LHR	1/27/79	1600-2158	193			
114	GP422	LHR-LAX	1/28/79	1234-2245	297			
115	GP422	LAX-HNL	1/29/79	0508-0947	118			
116	GP422	HNL-AKL	1/29/79	1219-1308	22			
117	GP425	JFK-LHR	2/ 9/79	1537-2114	120	O W	C P A	
118	GP425	LHR-LAX	2/10/79	1246-2235	127	O W	C P A	
119	GP425	LAX-HNL	2/11/79	0542-1042	75	O W	C P A	
120	GP425	HNL-OSA	2/11/79	2336-0750	95	O W	C P A	
121	GP425	OSA-HNL	2/12/79	1037-1634	83	O W	C P A	
122	GP425	HNL-NRT	2/12/79	2152-0512	87	O W	C P A	
123	GP425	NRT-HKG	2/13/79	0822-1232	50	O W	C P A	
124	GP425	HKG-DEL	2/13/79	1438-2001	60	O W	C P A	
125	GP425	DEL-FRA	2/13/79	2157-0637	99	O W	C P A	
126	GP425	FRA-LHR	2/14/79	0815-0850	8	O W	P A	
127	GP425	LHR-JFK	2/14/79	1138-1742	71	O W	C P A	
128	GP425	JFK-IAH	2/15/79	0001-0226	29	O W	C P A	
129	GP425	IAH-MEX	2/15/79	0420-0539	17	O W	P A	
130	GP425	MEX-IAH	2/15/79	1647-1749	30	O W	C P A	
131	GP425	IAH-JFK	2/15/79	2049-2249	24	O W	C P A	
132	GP425	JFK-LHR	2/16/79	0210-0735	61	O W	C P A	

a0 denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei.

TAPE VL0024, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
136	GP0425	HKG-NRT	2/17/79	0527-0803	32	O W C P A
137	GP0425	NRT-LAX	2/17/79	1053-1903	99	O W C P A
138	GP0425	LAX-SFO	2/17/79	2152-2217	6	O W P A
139	GP0425	SFO-SEA	2/18/79	0109-0204	12	O W P A
140	GP0425	SEA-LHR	2/18/79	0400-1230	101	O W C P A
141	GP0425	LHR-SEA	2/18/79	1525-2347	154	O W C P A
142	GP0425	SEA-SFO	2/19/79	0237-0337	13	O W C P A
143	GP0425	SFO-NRT	2/20/79	0022-0952	115	O W C P A
144	GP0425	NRT-HNL	2/20/79	1245-1815	3733	O W C P A
145	GP0425	HNL-OSA	2/20/79	2247-0707	6267	O W C P A
146	GP0425	OSA-HNL	2/21/79	1035-1624	4628	O W C P A
147	GP0425	HNL-NRT	2/21/79	2154-0559	98	O W C P A
148	GP0425	NRT-HKG	2/22/79	0821-1156	44	O W C P A
149	GP0425	HKG-DEL	2/22/79	1428-1933	62	O W C P A
150	GP0425	DEL-FRA	2/22/79	2146-0643	2137	O W C P A
151	GP0425	FRA-JFK	2/23/79	0941-1647	86	O W C P A

^aO denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei.

TAPE VL0025, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records		Constituent data (a)
1	GP435	JFK-FCO	2/24/79	0021-0731	1351	O W	C P A
2	GP435	FCO-IST	2/24/79	1001-1126	18	O W	C P A
3	GP435	IST-BOM	2/24/79	1309-1731	3337	O W	C P A
4	GP435	BOM-THR	2/25/79	0000-0340	44	O W	C P A
5	GP435	THR-IST	2/25/79	0817-1046	389	O W	C P A
6	GP435	IST-FCO	2/25/79	1238-1408	19	O W	C P A
7	GP435	FCO-JFK	2/25/79	1748-0201	1993	O W	C P A
8	GP435	JFK-FRA	2/27/79	2353-0552	3825	O W	C P A
9	GP435	FRA-JFK	2/28/79	1053-1823	91	O W	C P A
10	GP435	JFK-FRA	3/ 1/79	0057-0649	905	O W	C P A
11	GP435	FRA-JFK	3/ 1/79	1051-1810	110	O W	C P A
12	GP435	JFK-CUN	3/ 2/79	1548-1837	44	O W	C P A
13	GP435	CUN-JFK	3/ 2/79	2353-0221	305	O W	C P A
14	GP435	JFK-FRA	3/ 3/79	2347-0603	1281	O W	C P A
15	GP435	FRA-JFK	3/ 4/79	1028-1757	1775	O W	C P A
16	GP4355	JFK-FRA	3/ 5/79	0219-0828	1242	O W	C P A
17	GP4355	FRA-JFK	3/ 5/79	1253-2051	2890	O W	C P A
18	GP4355	JFK-FRA	3/ 6/79	0154-0745	1271	O W	C P A
19	GP4355	FRA-JFK	3/ 6/79	1251-2025	2358	O W	C P A
20	GP4355	JFK-FRA	3/ 7/79	0224-0820	1195	O W	C P A
21	GP4355	FRA-JFK	3/ 7/79	1255-2015	89	O W	C P A
22	GP4355	JFK-IAH	3/ 8/79	0019-0240	1519	O W	C P A
23	GP4355	IAH-MEX	3/ 8/79	0422-0527	383	O W	C P A
24	GP4355	MEX-IAH	3/ 8/79	1701-1805	368	O W	C P A
25	GP4355	IAH-JFK	3/ 8/79	0000-0000M	1290	O W	C P A
26	GP4355	JFK-LHR	3/ 9/79	0213-0718	62	O W	C P A
27	GP4355	LHR-FRA	3/ 9/79	1019-1039	5	O W	C P A
28	GP4355	FRA-DEL	3/ 9/79	1326-1946	822	O W	C P A
29	GP4355	DEL-HKG	3/ 9/79	2223-0035	1468	O W	C P A

^a0 denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei.

TAPE VL0026, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
1	GP434	SFO-NRT	3/13/79	0021-0936	112	O W C P A
2	GP434	NRT-HNL	3/13/79	1204-1759	68	O W C P A
3	GP434	HNL-NRT	3/13/79	2144-0519	92	O W C P
4	GP434	NRT-HKG	3/14/79	0820-1215	64	O W C P
5	GP434	HKG-DEL	3/14/79	1448-2003	64	O W C P
6	GP434	DEL-FRA	3/14/79	2204-0559	95	O W C P
7	GP434	FRA-LHR	3/15/79	0828-0903	24	O W C P
8	GP434	LHR-JFK	3/15/79	1139-1749	75	O W C P
9	GP434	JFK-FCO	3/16/79	0307-1009	103	O W C P
10	GP434	FCO-IST	3/16/79	1222-1344	17	O W C P
11	GP434	IST-THR	3/16/79	1528-1723	24	O W C P
12	GP434	THR-KHI	3/16/79	1909-2044	20	O W C P
13	GP434	KHI-THR	3/17/79	0000-0000M	25	O W C P
14	GP434	THR-IST	3/17/79	0522-0727	26	W P
15	GP434	IST-FCO	3/17/79	0908-1043	20	W P
16	GP434	FCO-JFK	3/17/79	1356-2108	87	W
17	GP434	JFK-FRA	3/18/79	0325-1013	99	W
18	GP434	FRA-JFK	3/18/79	1418-2014	89	W
19	GP434	JFK-LHR	3/19/79	0000-0000M	77	W
20	GP434	LHR-JFK	3/20/79	1437-2037	73	W
21	GP434	JFK-FRA	3/21/79	0203-0843	81	W
22	GP434	FRA-JFK	3/21/79	1250-1945	83	W
23	GP434	JFK-LHR	3/24/79	1545-2135	71	O W C
24	GP434	LHR-SEA	3/25/79	1227-2052	102	O W C
25	GP434	SEA-LHR	3/26/79	0356-1131	92	O W C
26	GP434	LHR-SEA	3/26/79	1511-2331	101	O W C
27	GP434	SEA-SFO	3/27/79	0231-0331	13	O W C
28	GP434	SFO-LAX	3/27/79	1611-1631	5	O W
29	GP434	LAX-GUA	3/27/79	1853-2218	42	O W C
30	GP434	GUA-PTY	3/28/79	0024-0134	31	O W
31	GP434	PTY-GIG	3/28/79	0000-0000M	81	O W C
32	GP434	GIG-PTY	3/29/79	0330-0915	70	O W C
33	GP434	PTY-GUA	3/29/79	1255-1410	16	O W
34	GP434	GUA-LAX	3/29/79	1659-2049	47	O W C
35	GP434	LAX-SFO	3/29/79	2323-2346	22	O W
36	GP434	SFO-HNL	3/30/79	0533-0946	87	O W C
37	GP434	HNL-GUM	3/30/79	1234-1934	85	O W C
38	GP434	GUM-MNL	3/30/79	2157-0029	48	O W C
39	GP434	MNL-GUM	3/31/79	0552-0817	30	O W C
40	GP434	GUM-HNL	3/31/79	1101-1641	69	O W C
41	GP434	HNL-OSA	3/31/79	2311-0716	98	O W C
42	GP434	OSA-HNL	4/ 1/79	1222-1841	76	O W C
43	GP434	HNL-LAX	4/ 1/79	2138-0147	67	O W C
44	GP434	LAX-LHR	4/ 2/79	2201-0701	109	O W C
45	GP434	LHR-IAD	4/ 3/79	1124-1759	80	O W C
46	GP434	IAD-DTW	4/ 3/79	2019-2045	30	O W
47	GP434	DTW-IAD	4/ 3/79	2339-2359	5	O W
48	GP434	IAD-LHR	4/ 4/79	0218-0808	71	O W C
49	GP434	LHR-SEA	4/ 4/79	1218-2053	104	O W C
50	GP434	SEA-LHR	4/ 5/79	0359-1209	99	O W C
51	GP434	LHR-SEA	4/ 5/79	0000-0000M	106	O W C
52	GP434	SEA-SFO	4/ 6/79	0254-0404	15	O W C
53	GP434	SFO-LAX	4/ 6/79	1606-1626	5	O W
54	GP434	LAX-GUA	4/ 6/79	1905-2235	43	O W C
55	GP434	GUA-CCS	4/ 7/79	0049-0324	32	O W C
56	GP434	CCS-GUA	4/ 7/79	1201-1431	31	O W C
57	GP434	GUA-LAX	4/ 7/79	1743-2138	65	O W C
58	GP434	LAX-SFO	4/ 8/79	0056-0116	5	O W
59	GP434	SFO-HNL	4/ 8/79	0551-0951	49	O W C
60	GP434	HNL-GUM	4/ 8/79	1230-1925	84	O W C
61	GP434	GUM-MNL	4/ 8/79	2157-0027	31	O W C
62	GP434	MNL-GUM	4/ 9/79	0612-0837	30	O W C
63	GP434	GUM-HNL	4/ 9/79	1103-1633	67	O W C
64	GP434	HNL-SFO	4/ 9/79	2113-0108	47	O W C
65	GP434	SFO-LAX	4/10/79	0000-0000M	4	O W

^aO denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei.

TAPE VL0026, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
66	GP434	LAX-GUA	4/10/79	1844-2159	40	O W C
67	GP434	GUA-PTY	4/11/79	0033-0148	16	O W C
68	GP434	PTY-GIG	4/11/79	0404-0928	82	O W C
69	GP434	GIG-PTY	4/12/79	0422-1008	87	O W C
70	GP434	PTY-GUA	4/12/79	1257-1407	15	O W
71	GP434	GUA-LAX	4/12/79	1737-2122	46	O W C
72	GP434	LAX-SFO	4/13/79	0020-0040	5	O W
73	GP434	SFO-LAX	4/13/79	1601-1621	5	O W
74	GP434	LAX-GUA	4/13/79	1842-2214	59	O W C
75	GP434	GUA-CCS	4/14/79	0021-0251	31	O W C
76	GP434	CCS-MIA	4/14/79	1337-1552	28	O W C
77	GP434	MIA-CUR	4/14/79	1924-2134	27	O W
78	GP434	CCS-MIA	4/15/79	0231-0451	29	
79	GP434	MIA-CCS	4/15/79	0743-0943	25	W
80	GP434	CCS-MIA	4/15/79	1332-1549	26	W
81	GP434	MIA-CCS	4/15/79	1931-2139	44	W
82	GP434	CCS-MIA	4/16/79	0109-0324	28	W
83	GP434	MIA-CCS	4/16/79	0620-0825	26	W
84	GP434	CCS-MIA	4/16/79	1547-1757	27	W
85	GP434	MIA-CCS	4/16/79	2101-2306	39	W
86	GP434	CCS-SJU	4/17/79	0137-0212	8	
87	GP434	SJU-CCS	4/17/79	0807-0842	8	W
88	GP434	CCS-GUA	4/18/79	1132-1407	32	W
89	GP434	GUA-LAX	4/18/79	1713-2108	48	W
90	GP434	LAX-SFO	4/18/79	2357-0012	4	W
91	GP434	SFO-HNL	4/19/79	0556-1016	53	W
92	GP434	HNL-GUM	4/19/79	1236-1926	84	W
93	GP434	GUM-MNL	4/19/79	2202-0027	30	W
94	GP434	MNL-GUM	4/20/79	0603-0833	31	W
95	GP434	GUM-HNL	4/20/79	1058-1718	77	W
96	GP434	HNL-SFO	4/20/79	2103-0033	43	W
97	GP434	SFO-HNL	4/21/79	0550-1025	56	W
98	GP434	HNL-GUM	4/21/79	1233-1858	78	W
99	GP434	GUM-NRT	4/21/79	2333-0153	28	W
100	GP434	NRT-GUM	4/22/79	0439-0709	31	W
101	GP434	GUM-HNL	4/22/79	1059-1724	78	W
102	GP434	HNL-NRT	4/22/79	2034-0354	89	W
103	GP434	NRT-HKG	4/23/79	0719-1034	40	W
104	GP434	HKG-DEL	4/23/79	1321-1821	61	W
105	GP434	DEL-KHI	4/23/79	2031-2126	12	W
106	GP434	KHI-FRA	4/23/79	2327-0622	84	W
107	GP434	FRA-LHR	4/24/79	0844-0914	7	W
108	GP434	LHR-JFK	4/24/79	1200-1820	77	W
109	GP434	JFK-FRA	4/25/79	0015-0625	75	W
110	GP434	FRA-JFK	4/25/79	1031-1736	86	W
111	GP434	PHL-NCE	4/26/79	0148-0833	82	W
112	GP434	NCE-JFK	4/26/79	1129-1909	93	W
113	GP434	JFK-DFW	4/26/79	2205-0027	62	W
114	GP434	DFW-JFK	4/27/79	0227-0432	26	W
115	GP434	JFK-LHR	4/27/79	1548-2133	70	W
116	GP434	LHR-JFK	4/29/79	1300-1915	72	W
117	GP434	JFK-LHR	4/30/79	1743-2325	69	W
118	GP434	LHR-IAD	5/ 1/79	1020-1656	80	W
119	GP434	IAD-DTW	5/ 1/79	1910-1935	6	W
120	GP434	DTW-IAD	5/ 2/79	0007-0027	5	W
121	GP434	JFK-LAX	5/ 2/79	2228-0403	56	W
122	GP434	LAX-GUA	5/ 3/79	1755-2125	62	W
123	GP434	GUA-PTY	5/ 3/79	2333-0044	32	W
124	GP434	PTY-GIG	5/ 4/79	0308-0848	69	W
125	GP434	GIG-JFK	5/ 5/79	0222-1034	99	W
126	GP434	JFK-LHR	5/ 5/79	1440-2010	67	W
127	GP434	LHR-SFO	5/ 6/79	0840-1930	119	W
128	GP434	SFO-NRT	5/ 6/79	2349-0945	136	W
129	GP434	NRT-HNL	5/ 7/79	0000-0000M	73	W
130	GP434	HNL-OSA	5/ 7/79	2356-0736	93	W
131	GP434	OSA-HNL	5/ 8/79	1043-1713	79	W
132	GP434	HNL-SFO	5/ 8/79	2040-0025	46	W

a0 denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei.

TAPE VL0026, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)	
1	GP442	SFO-HNL	5/ 9/79	0417-0847	51	W	P
2	GP442	HNL-GUM	5/ 9/79	1149-1859	88	W	P
3	GP442	GUM-NRT	5/10/79	0000-0235	32	W	P
4	GP442	NRT-GUM	5/10/79	0451-0716	30	W	P
5	GP442	GUM-HNL	5/10/79	1032-1617	70	W	P
6	GP442	HNL-NRT	5/10/79	2132-0442	87	W	P
7	GP442	NRT-HKG	5/11/79	0701-1041	45	W	P
8	GP442	HKG-DEL	5/11/79	1235-1724	75	W	P
9	GP442	DEL-KHI	5/11/79	1933-2028	12	W	P
10	GP442	KHI-FRA	5/11/79	2231-0506	80	W	P
11	GP442	FRA-LHR	5/12/79	0709-0739	7	W	P
12	GP442	LHR-JFK	5/12/79	1033-1643	67	W	P
13	GP442	JFK-LAX	5/12/79	2343-0418	56	W	P
14	GP442	LAX-PPT	5/13/79	0721-1433	97	W	P
15	GP442	PPT-PPG	5/14/79	0839-1058	94	W	P
16	GP442	PPG-HNL	5/14/79	1257-1707	51	W	P
17	GP442	HNL-SFO	5/14/79	2032-0037	50	W	P
18	GP442	SFO-HNL	5/15/79	0438-0828	47	W	P
19	GP442	HNL-GUM	5/15/79	1118-1758	81	W	P
20	GP442	GUM-NRT	5/15/79	2351-0226	32	W	P
21	GP442	NRT-GUM	5/16/79	0454-0724	31	W	P
22	GP442	GUM-HNL	5/16/79	1019-1634	76	W	P
23	GP442	HNL-SFO	5/16/79	2136-0141	50	W	P
24	GP442	SFO-HNL	5/17/79	0520-0910	47	O W	C P
25	GP442	HNL-GUM	5/17/79	1129-1744	76	O W	C P
26	GP442	GUM-MNL	5/17/79	2056-2316	29	O W	C P
27	GP442	MNL-GUM	5/18/79	0452-0727	32	O W	C P
28	GP442	GUM-HNL	5/18/79	1033-1652	109	O W	C P
29	GP442	HNL-LAX	5/18/79	2050-0105	52	O W	C P
30	GP442	LAX-GUA	5/19/79	1744-2124	45	O W	C P
31	GP442	GUA-SJO	5/19/79	2331-0006	8	O W	P
32	GP442	SJO-PTY	5/20/79	0138-0158	5	O W	P
33	GP442	PTY-SJO	5/20/79	1137-1157	5	O W	P
34	GP442	SJO-GUA	5/20/79	1335-1415	9	O W	P
35	GP442	GUA-LAX	5/20/79	1627-2017	47	O W	C P
36	GP442	LAX-LHR	5/21/79	0216-1139	130	O W	C P
37	GP442	LHR-JFK	5/21/79	1740-0000	77	O W	C P
38	GP442	JFK-FRA	5/23/79	0135-0735	73	O W	P
39	GP442	FRA-JFK	5/23/79	1308-2017	86	O W	P
40	GP442	JFK-LHR	5/24/79	0006-0521	64	O W	P
41	GP442	LHR-FRA	5/24/79	0751-0821	7	O W	P
42	GP442	FRA-BOM	5/24/79	1019-1731	116	O W	P
43	GP442	BOM-BKK	5/24/79	1955-2255	37	O W	P
44	GP442	BKK-HKG	5/25/79	0056-0236	21	O W	P
45	GP442	HKG-NRT	5/25/79	0542-0832	35	O W	P
46	GP442	NRT-LAX	5/25/79	1045-1903	100	O W	P
47	GP442	LAX-HNL	5/26/79	0013-0433	53	O W	P
48	GP442	HNL-PPG	5/26/79	0705-1119	77	O W	P
49	GP442	PPG-PPT	5/26/79	1325-1535	27	O W	P
50	GP442	PPT-LAX	5/27/79	0632-1327	84	O W	P
51	GP442	LAX-JFK	5/27/79	1830-2235	50	O W	P
52	GP442	JFK-FCO	5/28/79	0150-0830	81	O W	P
53	GP442	FCO-JFK	5/28/79	1146-1941	96	O W	P
54	GP442	JFK-IAH	5/28/79	2316-0146	31	O W	P
55	GP442	IAH-MEX	5/29/79	0325-0435	15	O W	P
56	GP442	MEX-IAH	5/29/79	1428-1603	20	O W	P
57	GP442	IAH-JFK	5/29/79	1833-2042	43	O	P
58	GP442	JFK-LHR	5/30/79	0024-0554	67	O W	P
59	GP442	LHR-FRA	5/30/79	0825-0845	5	O	P
60	GP442	FRA-THR	5/30/79	1108-1513	50	O W	P
61	GP442	THR-DEL	5/30/79	1654-1914	29	O W	P
62	GP442	DEL-HKG	5/30/79	2209-0254	58	O W	P
63	GP442	HKG-NRT	5/31/79	0525-0830	38	O W	P
64	GP442	NRT-LAX	5/31/79	1049-1914	102	O W	P
65	GP442	LAX-HNL	6/ 1/79	0351-0806	52	O W	P

20 denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds.

TAPE VL0026, FILE 0001
[Aircraft N655PA]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
66	GP442	HNL-NAN	6/ 1/79	1051-1611	65	O W P
67	GP442	NAN-SYD	6/ 1/79	0000-0000M	42	O W P
68	GP442	SYD-MEL	6/ 2/79	0215-0245	7	O W P
69	GP442	MEL-SYD	6/ 2/79	0447-0512	6	O P
70	GP442	SYD-NAN	6/ 2/79	0833-1133	37	O W P
71	GP442	NAN-HNL	6/ 2/79	1330-1830	61	O W P
72	GP442	HNL-LAX	6/ 2/79	2215-0220	50	O W P
73	GP442	LAX-HNL	6/ 3/79	0525-0950	54	O W P
74	GP442	HNL-NRT	6/ 3/79	2132-0422	83	O W P
75	GP442	NRT-HKG	6/ 4/79	0654-1004	39	O W P
76	GP442	HKG-DEL	6/ 4/79	1223-1658	56	O W P
77	GP442	DEL-KHI	6/ 4/79	1924-2019	12	O W P
78	GP442	KHI-FRA	6/ 4/79	2210-0435	78	O W P
79	GP442	FRA-LHR	6/ 5/79	0712-0742	7	O W P
80	GP442	LHR-JFK	6/ 5/79	1038-1714	78	O W P
81	GP442	JFK-LHR	6/ 6/79	0134-0704	67	O W P
82	GP442	LHR-IAD	6/ 6/79	1010-1651	97	O W P
83	GP442	IAD-DTW	6/ 6/79	1900-1925	6	O W P
84	GP442	DTW-IAD	6/ 7/79	0008-0028	5	O W P
85	GP442	IAD-LHR	6/ 7/79	0256-0856	103	O W P

^aO denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds.

TAPE VL0027, FILE 0001
[Aircraft N4711U]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
1	GP399	SFO-HNL	10/ 7/78	0242-0645	49	O W C P A Z
2	GP399	HNL-SFO	10/ 7/78	0945-1350	47	O W C P A Z
3	GP399	SFO-JFK	10/ 7/78	1603-2013	49	O W C P A Z
4	GP399	JFK-SFO	10/ 7/78	2228-0316	71	O W C P A Z
5	GP399	HNL-LAX	10/ 8/78	2303-0322	51	O W C P A Z
6	GP399	LAX-JFK	10/ 9/78	0538-0934	45	O W P A Z F
7	GP399	JFK-ORD	10/ 9/78	1515-1635	17	O W P A Z
8	GP399	ORD-LAX	10/ 9/78	1840-2137	35	O W P A Z
9	GP399	LAX-ORD	10/ 9/78	2345-0230	33	O W P A Z
10	GP399	ORD-LAX	10/10/78	0456-0751	36	O W P A Z
11	GP399	LAX-HNL	10/10/78	1741-2159	65	O W P A Z
12	GP399	ITO-LAX	10/11/78	0207-0607	45	O W P A Z
13	GP399	LAX-HNL	10/11/78	1536-2002	61	O W P A Z
14	GP399	HNL-SFO	10/11/78	2230-0228	44	O W P A Z F
15	GP399	SFO-ORD	10/13/78	2117-0012	36	O W C P A Z
16	GP399	ORD-JFK	10/14/78	0213-0303	17	O W C P A Z
17	GP399	JFK-ORD	10/14/78	1216-1321	14	O W C P A Z
18	GP399	ORD-SFO	10/14/78	1539-1839	37	O W C P A Z
19	GP399	SFO-HNL	10/14/78	2114-0134	54	O W C P A Z
20	GP399	HNL-SFO	10/15/78	2006-2343	78	O W C P A Z
21	GP399	SFO-ORD	10/16/78	2050-2337	1776	O W C P A Z
22	GP399	ORD-JFK	10/17/78	0155-0245	11	O W C P A Z
23	GP399	JFK-ORD	10/17/78	1213-1320	34	O W C P A Z
24	GP399	ORD-SFO	10/17/78	1533-1853	41	O W C P A Z
25	GP398	SFO-JFK	10/17/78	2104-0049	46	O W C P A Z
26	GP398	JFK-ORD	10/18/78	1229-1323	132	O W C P A Z
27	GP398	ORD-SFO	10/18/78	1534-1914	1815	O W C P A Z
28	GP398	SFO-JFK	10/18/78	2106-0109	3052	O W C P A Z
29	GP398	JFK-SFO	10/19/78	1415-1841	70	O W C P A Z
30	GP398	SFO-HNL	10/19/78	2110-0100	47	O W C P A Z
31	GP398	HNL-ORD	10/20/78	0344-1044	84	O W C P A Z
32	GP398	ORD-DTW	10/20/78	1718-1723	2	W P
33	GP398	DTW-ORD	10/20/78	1908-1914	2	W P
34	GP398	ORD-LAX	10/20/78	2133-0033	37	O W C P A Z
35	GP398	LAX-JFK	10/22/78	1931-2311	45	O W C P A Z
36	GP398	JFK-LAX	10/23/78	0201-0646	58	O W C P A Z
37	GP398	LAX-JFK	10/23/78	1938-2313	44	O W C P A Z
38	GP398	JFK-LAX	10/24/78	0201-0641	3597	O W C P A Z
39	GP398	LAX-HNL	10/24/78	1600-2015	52	O W C P A Z
40	GP398	HNL-SFO	10/24/78	2235-0215	2704	O W C P A Z
41	GP398	SFO-ORD	10/25/78	2039-0059	54	O W C P A Z
42	GP398	ORD-JFK	10/26/78	0312-0357	10	O W C P A Z
43	GP398	JFK-ORD	10/26/78	1218-1333	16	O W C P A Z
44	GP398	ORD-SFO	10/26/78	1546-1850	37	O W C P A Z
45	GP400	SFO-JFK	10/26/78	2103-0053	47	O W C P A Z
46	GP400	JFK-SFO	10/27/78	1429-1911	3516	O W C P A Z F
47	GP400	SFO-HNL	10/27/78	2106-0111	50	O W C P A Z
48	GP400	HNL-ORD	10/28/78	0355-1032	80	O W C P A Z
49	GP400	HNL-SFO	10/30/78	2006-0000	2841	O W P A Z F
50	GP400	SFO-HNL	10/31/78	0347-0749	98	O W P A Z
51	GP400	HNL-LAX	10/31/78	1938-2353	68	O W P A Z
52	GP400	LAX-DEN	11/ 1/78	0335-0445	15	O W P A Z
53	GP400	DEN-ORD	11/ 1/78	0603-0718	16	O W P A Z
54	GP400	ORD-HNL	11/ 1/78	1715-0032	103	O W P A Z
55	GP400	HNL-ORD	11/ 2/78	0411-1100	2779	O W P A Z
56	GP400	ORD-JFK	11/ 2/78	1314-1418	369	O W P A Z
57	GP400	JFK-LAX	11/ 2/78	1736-2200	2453	O W P A Z
58	GP400	LAX-HNL	11/ 3/78	0045-0505	53	O W P A Z
59	GP400	LAX-HNL	11/ 3/78	1815-2235	53	O W P A Z
60	GP400	ITO-LAX	11/ 4/78	0309-0709	49	O W P A Z
61	GP400	LAX-ORD	11/ 4/78	0912-1207	36	O W P A Z
62	GP400	ORD-DEN	11/ 4/78	1452-1612	17	O W P A Z
63	GP400	DEN-LAX	11/ 4/78	1815-1925	15	O W P A Z
64	GP400	LAX-HNL	11/ 4/78	2205-0224	52	O W P A Z
65	GP400	SFO-HNL	11/ 6/78	0346-0755	129	O W P A Z

a0 denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei; Z, cabin ozone; F, filter exposure.

TAPE VL0027, FILE 0001
[Aircraft N4711U]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)				
66	GP400	HNL-SFO	11/ 6/78	1958-2348	47	O	W	P	A	Z
67	GP404	SFO-HNL	11/ 7/78	0352-0746	114	O	W	P	A	Z
68	GP404	HNL-SFO	11/ 7/78	1018-1428	50	O	W	P	A	Z
69	GP404	SFO-JFK	11/ 7/78	1700-2115	51	O	W	P	A	Z
70	GP404	JFK-SFO	11/ 7/78	2344-0424	57	O	W	P	A	Z
71	GP404	SFO-HNL	11/ 8/78	1728-2138	49	O	W	P	A	Z F
72	GP404	HNL-LAS	11/ 9/78	0020-0455	55	O	W	P	A	Z
73	GP404	LAS-LAX	11/ 9/78	1756-1806	3	O	W	P	A	Z
74	GP404	LAX-JFK	11/ 9/78	2033-0028	59	O	W	P	A	Z
75	GP404	JFK-LAX	11/10/78	0306-0741	56	O	W	P	A	Z
76	GP404	LAX-JFK	11/10/78	2055-0020	15	O	W	P	A	Z
77	GP404	JFK-LAX	11/11/78	0258-0743	45	O	W	P	A	Z F
78	GP404	LAX-ORD	11/11/78	1939-2059	4	O	W	P	A	Z
79	GP405	SFO-ORD	12/ 4/78	0056-0356	37	O	W	C	P	A Z
80	GP405	ORD-JFK	12/ 4/78	0605-0651	25	O	W	C	P	A Z
81	GP405	JFK-SFO	12/ 4/78	1527-2027	61	O	W	C	P	A Z
82	GP408	SFO-HNL	12/ 4/78	2226-0231	66	O	W	C	P	A Z
83	GP408	HNL-ORD	12/ 5/78	0436-1113	2402	O	W	C	P	A Z F
84	GP408	ORD-LAX	12/ 5/78	2025-2346	61	O	W	C	P	A Z
85	GP408	LAX-DEN	12/ 6/78	0249-0455	121	O	W	C	P	A Z
86	GP408	DEN-ORD	12/ 6/78	0725-0830	14	O	W	C	P	A Z
87	GP408	ORD-JFK	12/ 6/78	1405-1455	11	O	W	C	P	Z
88	GP408	JFK-LAX	12/ 6/78	1740-2225	58	O	W	C	P	Z
89	GP408	LAX-HNL	12/ 7/78	0033-0512	71	O	W	C	P	Z
90	GP408	HNL-SFO	12/ 7/78	2002-2341	61	O	W	C	P	Z

^aO denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei; Z, cabin ozone; F, filter exposure.

TAPE VL0028, FILE 0001
[Aircraft N4711U]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
1	GP413	SFO-JFK	12/ 8/78	0155-0540	45	O W P Z
2	GP413	JFK-ORD	12/ 8/78	1313-1433	17	O W P Z
3	GP413	ORD-SFO	12/ 8/78	1720-2047	56	O W C P Z
4	GP413	SFO-JFK	12/ 9/78	0114-0459	46	O W C P Z
5	GP413	JFK-ORD	12/ 9/78	1306-1431	17	O W P Z
6	GP413	ORD-SFO	12/ 9/78	1705-2020	40	O W C P Z
7	GP413	SFO-HNL	12/ 9/78	2220-0220	49	O W C P Z
8	GP413	HNL-SFO	12/10/78	1022-1411	36	O W P Z
9	GP413	SFO-JFK	12/10/78	1656-2051	48	O W P Z
10	GP413	JFK-SFO	12/10/78	2350-0450	61	O W C P Z
11	GP413	SFO-HNL	12/11/78	1730-2155	43	O W P Z
12	GP413	HNL-LAX	12/12/78	0146-0426	13	O W P Z
13	GP413	LAX-JFK	12/12/78	0715-1100	29	O W P Z
14	GP413	JFK-ORD	12/12/78	1610-1725	16	O W P Z
15	GP413	ORD-LAX	12/12/78	1946-2306	41	O W P Z
16	GP413	LAX-ORD	12/13/78	1838-2108	31	O W P Z
17	GP413	SFO-HNL	12/16/78	0347-0757	49	O W P Z
18	GP413	HNL-SFO	12/16/78	1953-2353	47	O W P Z
19	GP413	SFO-HNL	12/17/78	0351-0810	51	O W P Z F
20	GP413	HNL-SFO	12/17/78	1018-1418	46	O W P Z
21	GP413	SFO-JFK	12/17/78	1844-2038	40	O W P Z
22	GP413	JFK-SFO	12/17/78	2338-0525	100	O W P Z
23	GP413	SFO-ORD	12/21/78	2130-0015	34	O W C P Z
24	GP413	ORD-JFK	12/22/78	0329-0419	11	O W C P Z
25	GP413	JFK-SFO	12/22/78	1501-2006	62	O W C P Z
26	GP413	SFO-HNL	12/22/78	2211-0226	52	O W C P A Z
27	GP413	HNL-ORD	12/23/78	0451-1116	906	O W C P A Z F
28	GP413	ORD-YYZ	12/23/78	1354-1414	5	O W P A Z
29	GP413	YYZ-ORD	12/23/78	1651-1731	9	O W C P A Z
30	GP413	ORD-HNL	12/23/78	1959-0334	92	O W C P A Z
31	GP413	HNL-ORD	12/24/78	0544-1223	81	O W C P A Z
32	GP413	ORD-YYZ	12/24/78	1402-1427	6	O W C P A Z
33	GP413	YYZ-ORD	12/24/78	1648-1728	9	O W C P A Z
34	GP413	ORD-HNL	12/24/78	1952-0357	98	O W C P A Z
35	GP413	HNL-SFO	12/25/78	1951-2311	30	O W C P A Z
36	GP413	SFO-HNL	12/26/78	0350-0830	57	O W C P A Z
37	GP413	HNL-SFO	12/26/78	1019-1354	2506	O W C P A Z F
38	GP413	SFO-JFK	12/26/78	1659-2049	47	O W C P A Z
39	GP413	JFK-SFO	12/26/78	2345-0450	62	O W C P A Z
40	GP412	SFO-ORD	12/27/78	2127-0007	33	O W C P A Z
41	GP412	ORD-JFK	12/28/78	0307-0352	10	O W C P A Z
42	GP412	JFK-SFO	12/28/78	1509-2009	61	O W C P A Z
43	GP412	SFO-HNL	12/28/78	2215-0230	52	O W C P A Z
44	GP412	HNL-ORD	12/29/78	0440-1113	2485	O W C P A Z F
45	GP412	ORD-YYZ	12/29/78	1421-1441	5	O W C P A Z
46	GP412	YYZ-ORD	12/29/78	1729-1926	190	O W C P A Z
47	GP412	ORD-HNL	12/29/78	2230-0710	105	O W C P A Z
48	GP412	HNL-SFO	12/30/78	2319-0239	41	O W C A Z
49	GP412	SFO-HNL	12/31/78	1728-2153	54	O W C A Z
50	GP412	HNL-LAX	1/ 1/79	0015-0402	2370	O W C A Z
51	GP412	LAX-JFK	1/ 1/79	0650-1023	2606	O W C A Z
52	GP412	JFK-LAX	1/ 1/79	1809-2249	1767	O W C A Z
53	GP412	LAX-HNL	1/ 2/79	0056-0546	59	O W C A Z
54	GP412	LAX-HNL	1/ 2/79	2131-2256	18	O W C A Z
55	GP412	HNL-SFO	1/ 2/79	2315-0241	2497	O W C A Z
56	GP412	SFO-HNL	1/ 4/79	1744-2214	55	O W A Z
57	GP412	HNL-LAX	1/ 5/79	0018-0403	46	O W A Z
58	GP412	LAX-JFK	1/ 5/79	0659-1037	61	O W A Z
59	GP412	HNL-SFO	1/ 7/79	1306-1411	14	O W A Z
60	GP412	SFO-JFK	1/ 7/79	1745-2055	39	O W C A Z
61	GP412	JFK-SFO	1/ 7/79	2350-0500	63	O W C A Z
62	GP412	SFO-ORD	1/ 8/79	2126-0011	34	O W C A Z
63	GP412	ORD-JFK	1/ 9/79	0303-0355	145	O W C A Z F
64	GP412	JFK-SFO	1/ 9/79	1506-2001	60	O W C A Z
65	GP418	SFO-HNL	1/ 9/79	2209-0243	104	O W C A Z

^aO denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei; Z, cabin ozone; F, filter exposure..

TAPE VL0028, FILE 0001
[Aircraft N4711U]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
66	GP418	HNL-ORD	1/10/79	0456-1112	203	O W C A Z
67	GP418	ORD-YYZ	1/10/79	1402-1422	5	O W C A Z
68	GP418	YYZ-ORD	1/10/79	1653-1733	9	O W C A Z
69	GP418	ORD-HNL	1/10/79	2041-0434	113	O W C A Z
70	GP418	HNL-SFO	1/11/79	1022-1342	41	O W C A Z
71	GP418	SFO-JFK	1/11/79	1718-2103	46	O W C A Z
72	GP418	JFK-SFO	1/11/79	2334-0457	99	O W C A Z
73	GP418	SFO-HNL	1/14/79	2203-0238	41	O W C A Z
74	GP418	HNL-LAX	1/16/79	1227-1341	39	O W C A Z
75	GP418	LAX-HNL	1/16/79	1843-2321	54	O W C A Z
76	GP418	ITO-LAX	1/17/79	0309-0656	63	O W C A Z
77	GP418	LAX-ORD	1/17/79	0908-1133	30	O W C Z
78	GP418	ORD-DEN	1/17/79	1545-1730	22	O W C Z
79	GP418	DEN-LAX	1/17/79	1950-2117	35	O W C Z
80	GP418	LAX-HNL	1/17/79	2321-0358	126	O W C Z
81	GP418	HNL-SFO	1/18/79	1953-2355	2968	O W C Z F
82	GP418	SFO-HNL	1/19/79	0454-0859	50	O W C Z
83	GP418	HNL-SFO	1/19/79	2002-2341	45	O W C Z
84	GP418	HNL-SFO	1/20/79	1957-2339	60	O W C Z
85	GP418	SFO-JFK	1/21/79	1658-2103	2671	O W C Z F
86	GP418	JFK-SFO	1/21/79	2354-0450	76	O W C Z
87	GP418	SFO-HNL	1/22/79	1733-2138	50	O W C Z
88	GP418	HNL-LAX	1/23/79	0013-0403	47	O W C Z
89	GP418	LAX-JFK	1/23/79	0647-1042	48	O W C Z
90	GP418	JFK-ORD	1/23/79	1615-1730	16	O W C Z
91	GP418	ORD-LAX	1/23/79	1956-2251	36	O W C Z
92	GP418	LAX-HNL	1/24/79	0409-0854	58	O W C Z
93	GP418	HNL-SFO	1/24/79	2013-2348	2592	O W C Z
94	GP418	SFO-HNL	1/25/79	0400-0810	51	O W C Z
95	GP418	HNL-SFO	1/25/79	1022-1402	45	O W C Z
96	GP418	SFO-JFK	1/25/79	1718-2143	56	O W C Z
97	GP418	JFK-SFO	1/26/79	0006-0441	56	O W C Z
98	GP418	SFO-ORD	1/26/79	2126-0011	34	O W C Z
99	GP418	ORD-JFK	1/27/79	0236-0331	12	O W C Z
100	GP418	JFK-SFO	1/27/79	1451-1921	55	O W C Z
101	GP418	SFO-HNL	1/27/79	2205-0210	50	O W C Z
102	GP418	HNL-ORD	1/28/79	0456-1142	99	O W C Z
103	GP418	ORD-YYZ	1/28/79	1406-1431	6	O W C Z
104	GP418	YYZ-ORD	1/28/79	1650-1715	6	O W C Z
105	GP418	ORD-HNL	1/28/79	1955-0325	91	O W C Z
106	GP418	HNL-SFO	1/29/79	2320-0316	48	O W C Z

O denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
A, condensation nuclei; Z, cabin ozone; F, filter exposure..

TAPE VL0029, FILE 0001

[Aircraft N4711U]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)		
1	GP419	SFO-HNL	1/30/79	1739-2142	49	O	W	Z
2	GP419	HNL-LAX	1/31/79	0019-0414	47	O	W	Z
3	GP419	LAX-JFK	1/31/79	0645-1020	44	O	W	Z
4	GP419	JFK-ORD	1/31/79	1604-1714	15	O	W	Z
5	GP419	ORD-LAX	1/31/79	1944-2303	56	O	W	Z
6	GP419	LAX-ORD	2/ 1/79	0106-0326	29	O		Z
7	GP419	ORD-LAX	2/ 1/79	0600-0920	41	O	W	Z
8	GP419	LAX-HNL	2/ 1/79	1840-2320	57	O	W	Z
9	GP419	ITO-LAX	2/ 2/79	0247-0635	2807	O	W	Z
10	GP419	LAX-ORD	2/ 2/79	0857-1116	1480	O	W	Z
11	GP426	SFO-HNL	2/ 7/79	1840-2300	53	O	W	P Z
12	GP426	HNL-LAX	2/ 8/79	0107-0500	64	O	W	P Z
13	GP426	LAX-JFK	2/ 8/79	0703-1059	2844	O	W	P Z F
14	GP426	JFK-SFO	2/ 8/79	1551-2046	59	O	W C	P Z
15	GP426	SFO-HNL	2/ 8/79	2243-0257	68	O	W	P Z
16	GP426	HNL-ORD	2/ 9/79	0511-1141	105	O	W	P Z
17	GP426	ORD-YYZ	2/ 9/79	1352-1412	5	O		P Z
18	GP426	YYZ-ORD	2/ 9/79	1646-1716	7	O	W	P Z
19	GP426	ORD-HNL	2/ 9/79	1955-0408	132	O	W	P Z
20	GP426	HNL-LAX	2/10/79	0950-1330	45	O	W	P Z
21	GP426	LAX-JFK	2/10/79	1703-2058	48	O	W	P Z
22	GP426	JFK-SFO	2/10/79	2332-0438	72	O	W C	P Z
23	GP426	SFO-LAX	2/11/79	1829-1859	7	O	W	P Z
24	GP426	LAX-JFK	2/11/79	2121-0116	48	O	W	P Z
25	GP426	JFK-LAS	2/12/79	0325-0745	53	O	W	P Z
26	GP426	LAS-LAX	2/12/79	1930-1955	6	O		P Z
27	GP426	LAX-HNL	2/12/79	2244-0349	62	O	W	P Z
28	GP426	HNL-SEA	2/13/79	0742-1142	41	O	W	P Z
29	GP426	SEA-ORD	2/13/79	1925-2135	27	O	W	P Z
30	GP426	ORD-LAX	2/13/79	2346-0256	39	O	W	P Z
31	GP426	LAX-HNL	2/14/79	0655-1200	56	O	W	P Z
32	GP426	HNL-LAX	2/14/79	1936-2306	43	O	W	P Z
33	GP426	LAX-DEN	2/15/79	0248-0358	15	O	W	P Z
34	GP426	DEN-ORD	2/15/79	0534-0641	31	O	W	P Z
35	GP426	ORD-HNL	2/15/79	1809-0234	135	O	W	P Z
36	GP426	HNL-ORD	2/16/79	0456-1121	78	O	W	P Z
37	GP426	ORD-JFK	2/16/79	1404-1454	11	O	W	P Z
38	GP426	JFK-LAX	2/16/79	1859-2354	60	O	W	P Z
39	GP426	LAX-HNL	2/17/79	0210-0715	62	O	W	P Z
40	GP426	HNL-SFO	2/17/79	2007-2342	44	O	W	P Z
41	GP426	SFO-HNL	2/18/79	0609-1054	58	O	W	P Z
42	GP426	HNL-SFO	2/18/79	2103-0023	41	O	W	P Z
43	GP426	SFO-HNL	2/19/79	0343-0848	62	O	W	P Z
44	GP426	HNL-SFO	2/19/79	1047-1412	42	O	W	P Z
45	GP426	SFO-HNL	2/20/79	1737-2228	79	O	W	P Z
46	GP426	LAX-JFK	2/21/79	0725-1100	44	O	W	P Z
47	GP426	JFK-ORD	2/21/79	1617-1747	19	O	W	P Z
48	GP426	ORD-LAX	2/21/79	2040-0000	41	O	W	P Z
49	GP426	LAX-DEN	2/22/79	0238-0348	15	O	W	P Z
50	GP426	DEN-ORD	2/22/79	0529-0635	30	O	W	P Z
51	GP426	ORD-HNL	2/22/79	1751-0141	95	O	W	P Z
52	GP426	HNL-SFO	2/23/79	2328-0259	51	O	W	P Z
53	GP426	LAX-JFK	2/24/79	2040-0032	80	O	W	P Z
54	GP426	JFK-LAX	2/25/79	0330-0757	71	O	W	P Z
55	GP426	LAX-ORD	2/25/79	1842-2210	42	O	W	P Z
56	GP426	ORD-DTW	2/26/79	0031-0039	19	O		Z
57	GP426	DTW-ORD	2/26/79	0219-0229	3	O	W	P Z
58	GP426	ORD-DTW	2/26/79	1834-1839	2		W	P
59	GP426	DTW-ORD	2/26/79	2006-2011	2		W	P
60	GP426	ORD-LAX	2/26/79	2249-0154	695	O	W	P Z F
61	GP426	LAX-HNL	2/27/79	0401-0846	56	O	W	P Z
62	GP426	HNL-SFO	2/27/79	0000-0000M	46	O	W	P Z
63	GP426	SFO-HNL	2/28/79	0000-0000M	52	O	W	P Z
64	GP426	HNL-SFO	2/28/79	0000-0000M	46	O	W	P Z
65	GP426	SFO-JFK	2/28/79	0000-0000M	66	O	W	P Z

00 denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
Z, cabin ozone; F, filter exposure.

TAPE VL0029, FILE 0001
[Aircraft N4711U]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)			
66	GP426	JFK-LAX	2/28/79	0000-0000M	55	O	W	P	Z
67	GP426	LAX-ORD	3/ 1/79	0000-0000M	326	O	W	P	Z F
68	GP426	ORD-DTW	3/ 1/79	0000-0000M	2			P	
69	GP426	DTW-ORD	3/ 2/79	0000-0000M	2		W	P	
70	GP426	ORD-HNL	3/ 2/79	0000-0000M	94	O	W	P	Z
71	GP426	HNL-SFO	3/ 3/79	0000-0000M	50	O	W	P	Z
72	GP431	SFO-HNL	3/ 5/79	0000-0000M	54	O	W	P	Z
73	GP431	HNL-LAX	3/ 6/79	0000-0000M	48	O	W	P	Z
74	GP431	LAX-JFK	3/ 6/79	0000-0000M	67	O	W	P	Z
75	GP431	JFK-ORD	3/ 6/79	0000-0000M	15	O	W	P	Z
76	GP431	ORD-LAX	3/ 6/79	0000-0000M	34	O	W	P	Z
77	GP431	LAX-ORD	3/ 7/79	0000-0000M	2064	O	W	P	Z
78	GP431	ORD-LAX	3/ 7/79	0000-0000M	1922	O	W	P	Z
79	GP431	LAX-HNL	3/ 7/79	0000-0000M	53	O	W	P	Z
80	GP431	HNL-ITO	3/ 8/79	0000-0000M	1				
81	GP431	ITO-LAX	3/ 8/79	0000-0000M	48	O	W	P	Z
82	GP431	LAX-JFK	3/ 8/79	0000-0000M	65	O	W	P	Z
83	GP431	JFK-LAX	3/ 9/79	0000-0000M	56	O	W	P	Z
84	GP431	LAX-JFK	3/ 9/79	0000-0000M	46	O	W	P	Z
85	GP431	JFK-LAX	3/10/79	0000-0000M	3466	O	W	P	Z
86	GP431	LAX-ORD	3/10/79	0000-0000M	1759	O	W	P	Z
87	GP431	ORD-DTW	3/11/79	0000-0000M	2			P	
88	GP431	DTW-ORD	3/11/79	0000-0000M	2			P	
89	GP431	ORD-LAX	3/11/79	0000-0000M	37	O	W	P	Z
90	GP431	LAX-HNL	3/12/79	0000-0000M	57	O	W	P	Z
91	GP431	HNL-LAX	3/12/79	0000-0000M	49	O	W	P	Z
92	GP431	LAX-DEN	3/13/79	0000-0000M	502	O	W	P	Z
93	GP431	DEN-ORD	3/13/79	0000-0000M	444	O	W	P	Z
94	GP431	ORD-DEN	3/13/79	0000-0000M	783	O	W	P	Z
95	GP431	DEN-LAX	3/13/79	0000-0000M	569	O	W	P	Z
96	GP431	LAX-HNL	3/13/79	0000-0000M	3069	O	W	P	Z
97	GP431	HNL-SFO	3/14/79	0000-0000M	44	O	W	P	Z

^aO denotes ozone; W, water vapor; C, carbon monoxide; P, particles and/or clouds;
Z, cabin ozone; F, filter exposure.

TAPE VL0030, FILE 0001
[Aircraft N4711U]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)
1	GP439	SFO-HNL	3/14/79	0000-0000M	54	O W P Z
2	GP439	HNL-LAX	3/15/79	0000-0000M	64	O W P Z
3	GP439	LAX-JFK	3/15/79	0000-0000M	59	O W P Z
4	GP439	JFK-ORD	3/15/79	0000-0000M	16	O W P Z
5	GP439	ORD-LAX	3/15/79	0000-0000M	39	O W P Z
6	GP439	LAX-HNL	3/16/79	0000-0000M	1630	O W P Z
7	GP439	HNL-LAX	3/16/79	0000-0000M	2940	O W P Z
8	GP439	LAX-DEN	3/17/79	0000-0000M	33	O W P Z
9	GP439	DEN-ORD	3/17/79	0000-0000M	15	O W P Z
10	GP439	ORD-LAX	3/17/79	0000-0000M	55	O W P Z
11	GP439	LAX-JFK	3/17/79	0000-0000M	48	O W P Z
12	GP439	JFK-SFO	3/18/79	0000-0000M	58	O W P Z
13	GP439	SFO-HNL	3/19/79	0000-0000M	3293	O W P Z
14	GP439	HNL-LAX	3/19/79	0000-0000M	2469	O W P Z
15	GP439	LAX-DEN	3/20/79	0000-0000M	16	O W P Z
16	GP439	DEN-ORD	3/20/79	0000-0000M	14	O W P Z
17	GP439	ORD-LAX	3/20/79	0000-0000M	39	O W P Z
18	GP439	LAX-HNL	3/21/79	0000-0000M	57	O W P Z
19	GP439	HNL-LAX	3/21/79	0000-0000M	47	O W P Z
20	GP439	LAX-DEN	3/22/79	0000-0000M	543	O W P Z
21	GP439	DEN-ORD	3/22/79	0000-0000M	452	O W P Z
22	GP439	ORD-HNL	3/22/79	0000-0000M	90	O W P Z
23	GP439	HNL-ORD	3/23/79	0000-0000M	96	O W P Z
24	GP439	ORD-JFK	3/23/79	0000-0000M	13	O W P Z
25	GP439	JFK-LAX	3/23/79	0000-0000M	54	O W P Z
26	GP439	LAX-HNL	3/24/79	0000-0000M	56	O W P Z
27	GP439	LAX-JFK	3/24/79	0000-0000M	47	O W P Z
28	GP439	JFK-LAX	3/24/79	0000-0000M	52	O W P Z
29	GP439	LAX-HNL	3/25/79	0000-0000M	61	O W P Z
30	GP439	ITO-LAX	3/26/79	0000-0000M	43	O W P Z
31	GP439	LAX-ORD	3/26/79	0000-0000M	31	O W P Z
32	GP439	ORD-JFK	3/26/79	0000-0000M	12	O W P Z
33	GP439	JFK-LAX	3/26/79	0000-0000M	58	O W P Z
34	GP439	LAX-HNL	3/27/79	0000-0000M	63	O W P Z
35	GP439	HNL-LAX	3/27/79	0000-0000M	45	O W P Z
36	GP439	LAX-JFK	3/27/79	0000-0000M	45	O W P Z
37	GP439	JFK-LAX	3/28/79	0000-0000M	62	O W P Z
38	GP439	LAX-HNL	3/28/79	0000-0000M	3311	O W P Z
39	GP439	HNL-ITO	3/29/79	0000-0000M	1	W
40	GP439	ITO-LAX	3/29/79	0000-0000M	44	O W P Z
41	GP439	LAX-ORD	3/29/79	0000-0000M	33	O W P Z
42	GP439	ORD-DEN	3/29/79	0000-0000M	21	O W P Z
43	GP439	DEN-LAX	3/29/79	0000-0000M	33	O W P Z
44	GP439	LAX-HNL	3/29/79	0000-0000M	57	O W P Z
45	GP439	HNL-SFO	3/30/79	0000-0000M	128	O W P Z
46	GP439	ORD-HNL	4/ 4/79	0000-0000M	98	O W P Z
47	GP439	HNL-ORD	4/ 6/79	0000-0000M	2968	O W P Z
48	GP439	ORD-SFO	4/ 7/79	0000-0000M	57	O W P Z

^a0 denotes ozone; W, water vapor; P, particles and/or clouds; Z, cabin ozone.

TAPE VL0031, FILE 0001
[Aircraft N4711U]

	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)			
1	GP0445	SFO-HNL	5/29/79	2155-0150	48	O	W	P	Z
2	GP0445	HNL-ORD	5/30/79	0411-1110	101	O	W	P	Z
3	GP0445	ORD-HNL	5/30/79	1605-2339	92		W	P	Z
4	GP0445	HNL-ORD	5/31/79	0242-0941	101		W	P	Z
5	GP0445	ORD-LAX	5/31/79	1829-2144	40		W	P	Z
6	GP0445	LAX-ORD	6/ 1/79	1758-2032	41		W	P	Z
7	GP0445	ORD-DTW	6/ 1/79	2232-2232	1		W		
8	GP0445	DTW-ORD	6/ 2/79	1708-1713	2		W	P	
9	GP0445	JFK-SFO	6/ 2/79	1419-1854	56		W	P	Z
10	GP0445	SFO-HNL	6/ 2/79	2125-0125	49		W	P	Z
11	GP0445	HNL-ORD	6/ 3/79	0403-1112	87		W	P	Z
12	GP0445	ORD-DEN	6/ 3/79	1508-1638	19		W	P	Z
13	GP0445	DEN-LAX	6/ 3/79	1832-1947	14		W	P	Z
14	GP0445	LAX-HNL	6/ 3/79	2122-0125	117		W	P	Z
15	GP0445	HNL-LAX	6/ 4/79	2023-0043	53		W	P	Z
16	GP0445	LAX-DEN	6/ 5/79	0245-0406	33		W	P	Z
17	GP0445	DEN-ORD	6/ 5/79	0528-0643	16		W	P	Z
18	GP0445	ORD-HNL	6/ 5/79	1932-0247	4394		W	P	Z F
19	GP0445	HNL-ORD	6/ 6/79	0436-1111	80		W	P	Z
20	GP0445	ORD-JFK	6/ 6/79	1326-1426	13		W	P	Z
21	GP0445	JFK-LAX	6/ 6/79	1723-2133	51		W	P	Z
22	GP0445	LAX-HNL	6/ 7/79	0036-0501	54		W	P	Z
23	GP0445	HNL-SFO	6/ 7/79	1040-1425	46		W	P	Z
24	GP0445	SFO-JFK	6/ 7/79	1704-2054	47		W	P	Z
25	GP0445	JFK-SFO	6/ 8/79	0010-0454	57		W	P	Z
26	GP0445	SFO-HNL	6/ 8/79	0633-1057	54		W	P	Z
27	GP0445	HNL-SFO	6/ 8/79	2017-2347	43		W	P	Z
28	GP0445	SFO-HNL	6/ 9/79	0248-0713	54		W		Z
29	GP0445	HNL-LAX	6/ 9/79	1006-1401	48		W		Z
30	GP0445	LAX-HNL	6/ 9/79	1742-2204	39		W		Z
31	GP0445	ITO-LAX	6/10/79	0306-0607	2571		W		Z F
32	GP0445	LAX-HNL	6/10/79	1710-2150	57		W		Z
33	GP0445	HNL-SFO	6/10/79	2354-0334	45		W		Z
34	GP0445	SFO-ORD	6/12/79	2049-2337	51	O	W	P	Z
35	GP0445	JFK-SFO	6/13/79	1357-1847	59	O	W	P	Z
36	GP0445	SFO-HNL	6/13/79	2115-0140	54	O	W	P	Z
37	GP0445	HNL-ORD	6/14/79	0406-1031	78	O	W	P	Z
38	GP0445	ORD-HNL	6/14/79	1642-0047	98	O	W	P	Z
39	GP0445	HNL-SFO	6/15/79	0247-0617	43	O	W	P	Z
40	GP0445	SFO-HNL	6/15/79	1757-2229	2379	O	W	P	Z F
41	GP0445	HNL-LAX	6/16/79	0032-0422	47	O	W	P	Z
42	GP0445	LAX-HNL	6/16/79	1624-2109	58	O	W	P	Z
43	GP0445	HNL-SFO	6/16/79	2305-0245	45	O	W	P	Z
44	GP0445	SFO-HNL	6/17/79	1722-2129	50	O	W	P	Z
45	GP0445	HNL-LAX	6/17/79	2326-0321	48	O	W	P	Z
46	GP445	LAX-JFK	6/18/79	0559-0950	64	O	W	P	Z
47	GP445	JFK-ORD	6/18/79	1524-1634	15	O	W	P	Z
48	GP445	ORD-HNL	6/18/79	1922-0257	92	O	W	P	Z
49	GP445	HNL-ORD	6/19/79	0625-1314	2886	O	W	P	Z
50	GP445	ORD-LAX	6/19/79	1549-1849	1969	O	W	P	Z
51	GP445	LAX-HNL	6/19/79	2106-0131	54	O	W	P	Z
52	GP445	HNL-LAX	6/20/79	1139-1544	50	O	W	P	Z
53	GP445	LAX-JFK	6/20/79	1935-2328	97	O	W	P	Z
54	GP445	JFK-LAX	6/21/79	0208-0648	57	O	W	P	Z
55	GP445	LAX-ORD	6/21/79	1530-1800	31	O	W	P	Z
56	GP445	ORD-SEA	6/22/79	0037-0342	38	O	W	P	Z
57	GP445	SEA-ORD	6/22/79	0618-0844	30	O	W	P	Z
58	GP445	ORD-SFO	6/22/79	1608-1928	41	O	W	P	Z
59	GP441	SFO-HNL	6/22/79	2122-0137	52	O	W	P	Z
60	GP441	HNL-SFO	6/23/79	0953-1338	46	O	W	P	Z
61	GP441	LAX-JFK	6/24/79	1936-2320	2681	O	W	P	Z F
62	GP441	JFK-LAX	6/25/79	0240-0712	141	O	W	P	Z
63	GP441	LAX-JFK	6/25/79	1646-2041	48	O	W	P	Z
64	GP441	JFK-LAX	6/25/79	2310-0335	54	O	W	P	Z
65	GP441	LAX-JFK	6/26/79	1629-2024	47	O	W	P	Z

20 denotes ozone; W, water vapor; P, particles and/or clouds; Z, cabin ozone; F, filter exposure.

TAPE VL0031, FILE 0001
[Aircraft N4711U]

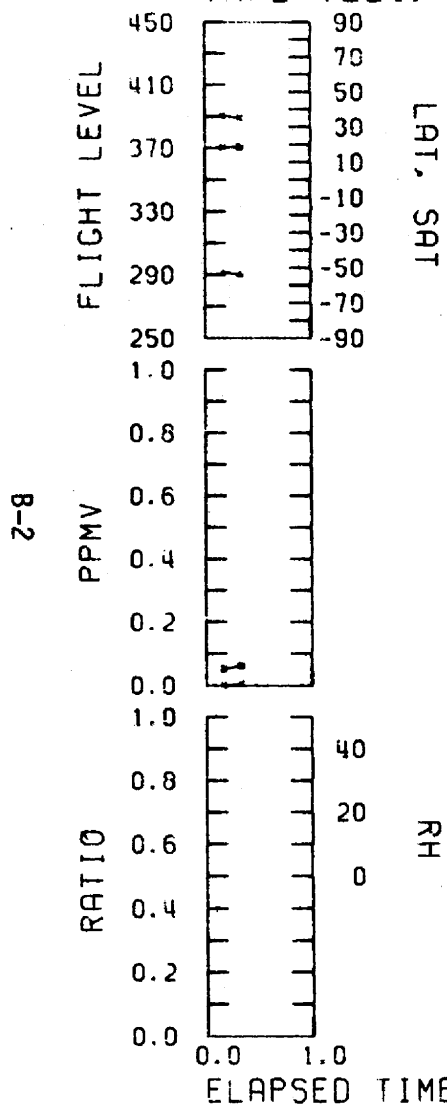
	Raw data tape number	Flight route	Departure date	Data time interval, GMT	Number of data records	Constituent data (a)			
66	GP441	JFK-LAX	6/26/79	2250-0305	50	O	W	P	Z
67	GP441	LAX-JFK	6/27/79	1934-2323	2254		W	P	F
68	GP441	JFK-LAX	6/28/79	0202-0626	70	O	W		Z
69	GP441	JFK-LAX	6/29/79	0219-0654	56	O	W		Z
70	GP441	LAX-JFK	6/29/79	1617-2019	66	O	W		Z
71	GP441	JFK-SFO	6/29/79	2309-0409	61	O	W		Z
72	GP441	SFO-ORD	6/30/79	2049-2337	34	O	W		Z
73	GP441	ORD-JFK	7/ 1/79	0136-0231	12	O	W		Z
74	GP441	JFK-ORD	7/ 1/79	1216-1316	13	O	W		Z
75	GP441	ORD-SFO	7/ 1/79	1608-1918	39	O	W		Z
76	GP441	SFO-HNL	7/ 1/79	2131-0136	50	O	W		Z
77	GP441	HNL-LAX	7/ 2/79	2005-2355	47	O	W		Z
78	GP441	LAX-HNL	7/ 3/79	0329-0759	55	O	W		Z
79	GP441	HNL-LAX	7/ 3/79	1019-1404	46	O	W		Z
80	GP441	LAX-HNL	7/ 3/79	1739-2216	56	O	W		Z
81	GP441	HNL-ITO	7/ 4/79	0101-0101	1				
82	GP441	ITO-LAX	7/ 4/79	0239-0614	44	O	W		Z
83	GP441	LAX-JFK	7/ 4/79	1618-2013	41	O	W		Z
84	GP441	JFK-LAX	7/ 4/79	2258-0327	39	O	W		Z
85	GP441	JFK-SFO	7/ 5/79	2302-0347	50	O	W		Z
86	GP441	SFO-HNL	7/ 6/79	1738-2158	53	O	W		Z
87	GP441	HNL-LAX	7/ 7/79	0013-0358	46	O	W		Z
88	GP441	LAX-ORD	7/ 7/79	0754-1025	49	O	W		Z
89	GP441	ORD-PHL	7/ 7/79	1436-1526	11	O	W		Z
90	GP441	PHL-ORD	7/ 7/79	1757-1857	13	O	W		Z
91	GP441	ORD-HNL	7/ 7/79	2204-0539	92	O	W		Z
92	GP441	HNL-LAX	7/ 8/79	0924-1259	44	O	W		Z
93	GP441	LAX-HNL	7/ 8/79	1547-2032	58	O	W		Z
94	GP441	HNL-LAX	7/ 8/79	2327-0322	48	O	W		Z
95	GP441	LAX-JFK	7/ 9/79	0555-0950	48	O	W		Z
96	GP441	JFK-ORD	7/ 9/79	1525-1630	14	O	W		Z
97	GP441	ORD-HNL	7/ 9/79	1943-0317	92	O	W		Z
98	GP441	HNL-ORD	7/10/79	0621-1306	82	O	W		Z
99	GP441	ORD-PHL	7/10/79	1509-1602	28	O	W		Z
100	GP441	PHL-ORD	7/10/79	1813-1908	12	O	W		Z
101	GP441	ORD-HNL	7/11/79	0053-0828	92	O	W		Z
102	GP441	HNL-SFO	7/11/79	2003-2353	47	O	W		Z
103	GP441	SFO-HNL	7/12/79	0251-0651	49	O	W		Z
104	GP441	HNL-LAX	7/12/79	1000-1410	51	O	W		Z
105	GP441	LAX-HNL	7/12/79	1626-2046	53	O	W		Z
106	GP441	HNL-SFO	7/12/79	2249-0234	46	O	W		Z

^aO denotes ozone; W, water vapor; P, particles and/or clouds; Z, cabin ozone;
F, filter exposure.

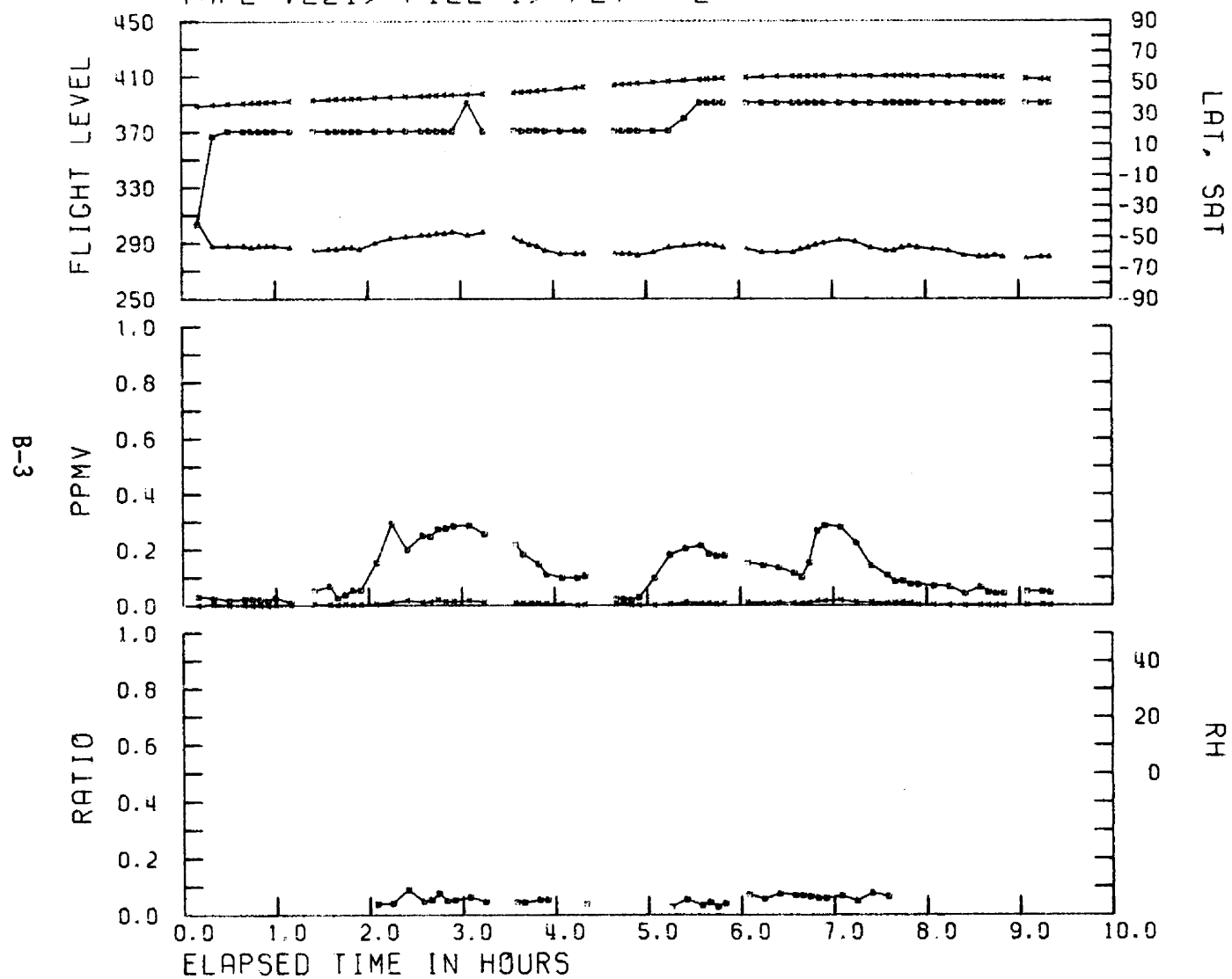
APPENDIX B

**FLIGHT PLOTS OF CABIN AND AMBIENT OZONE DATA FOR
N533PA (747SP) FOR THE PERIOD 10/5/78 to 6/30/79**

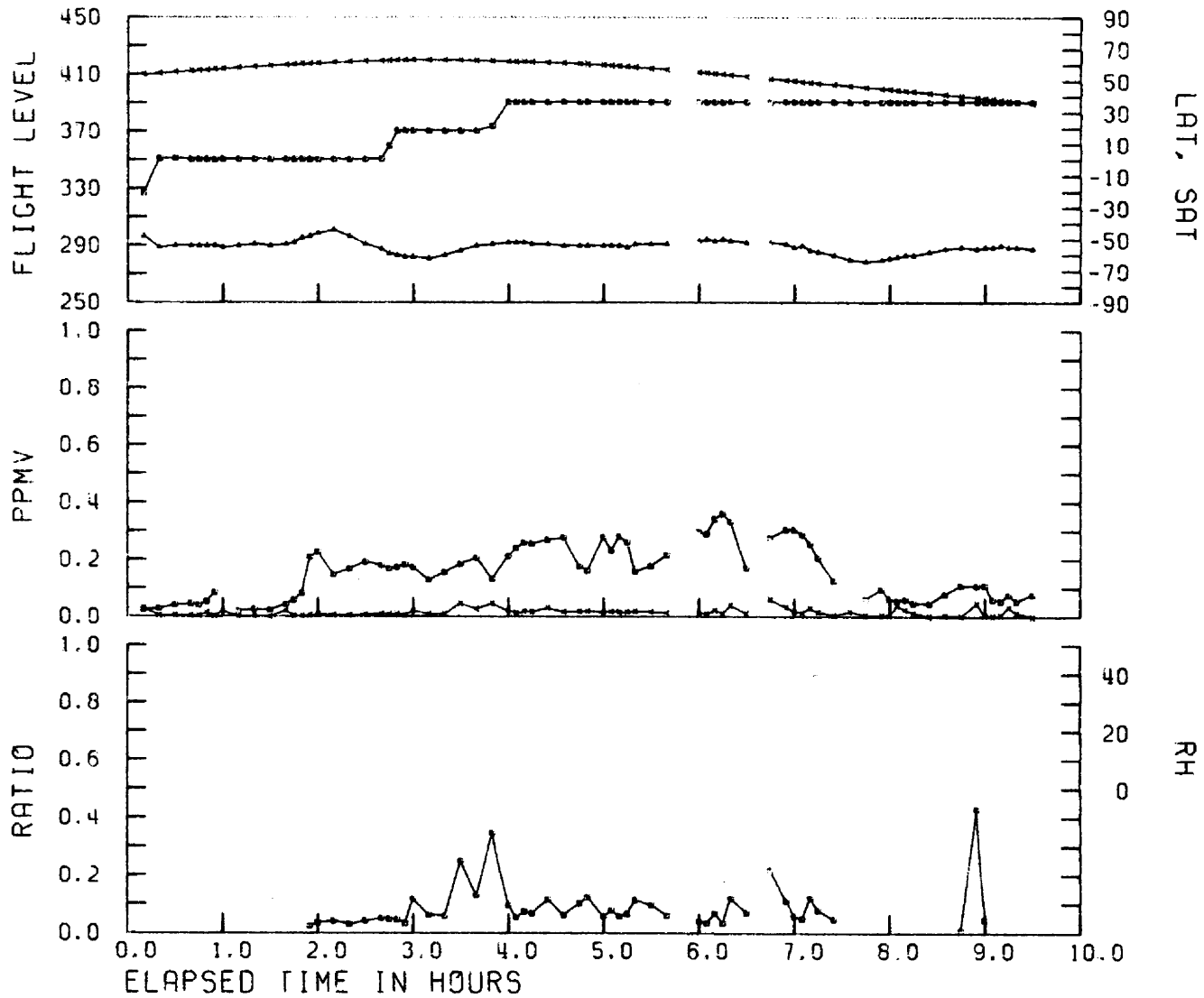
SFO TO LAX DEPARTURE 5 OCT 78 ~~PANAM~~ ~~NS33PA~~
TAPE VL21, FILE 1, FLT 1



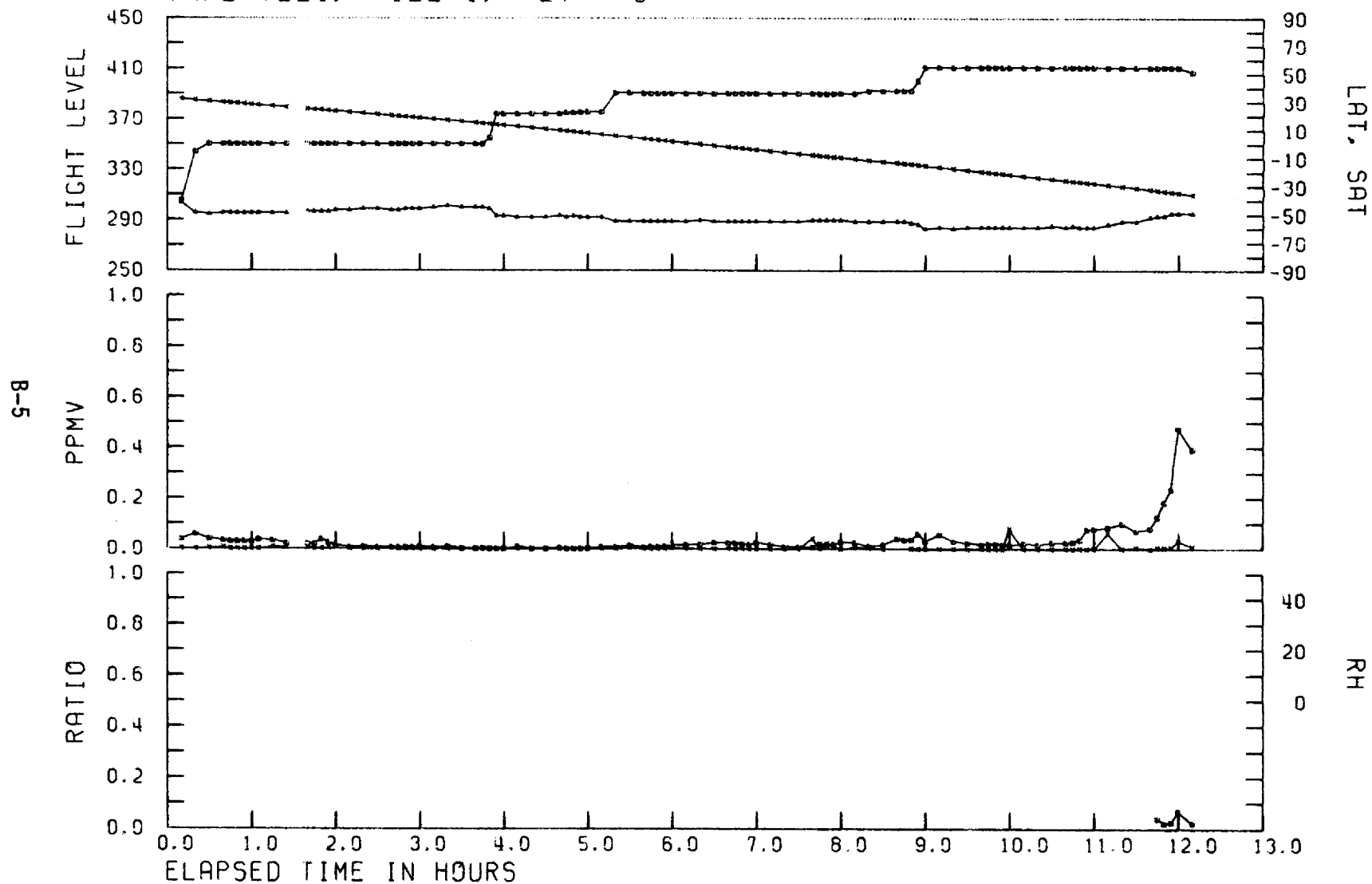
LAX TO LHR DEPARTURE 5 OCT 78 PANAM N533PA
TAPE VL21, FILE 1, FLT 2



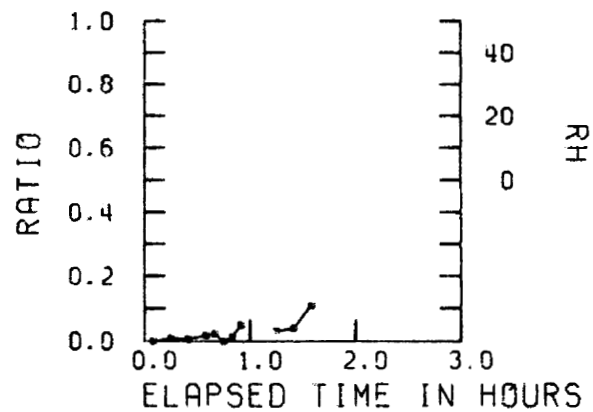
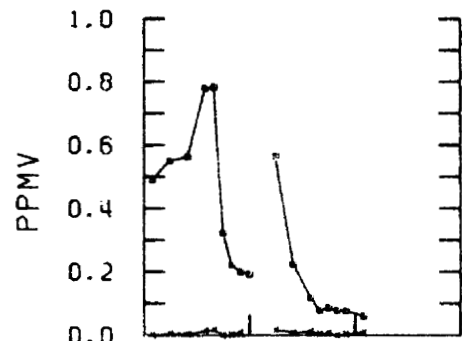
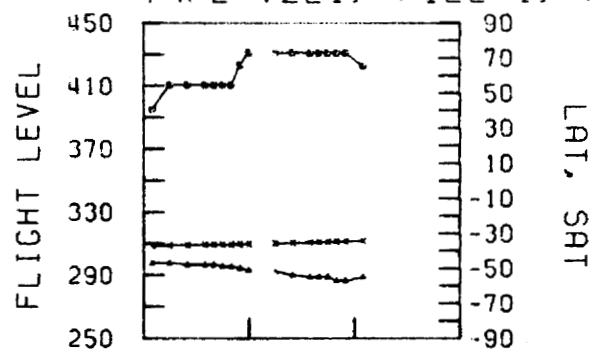
LHR TO LAX DEPARTURE 6 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 5



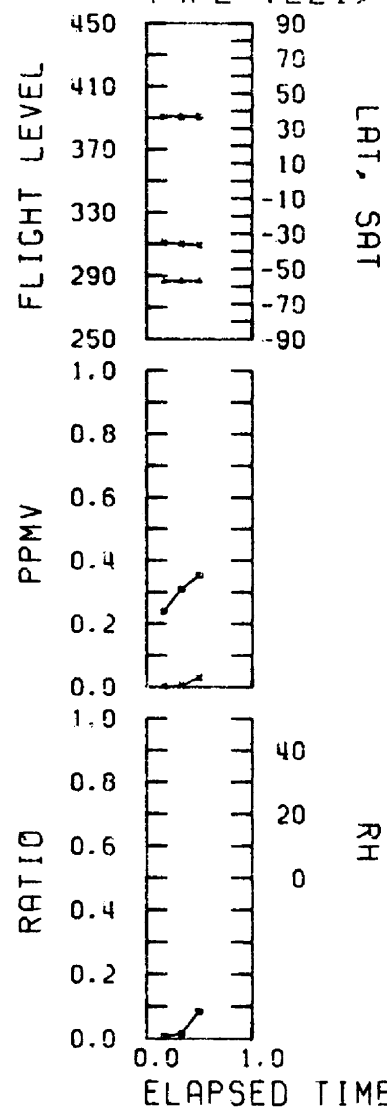
LAX TO AKL DEPARTURE 7 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 6



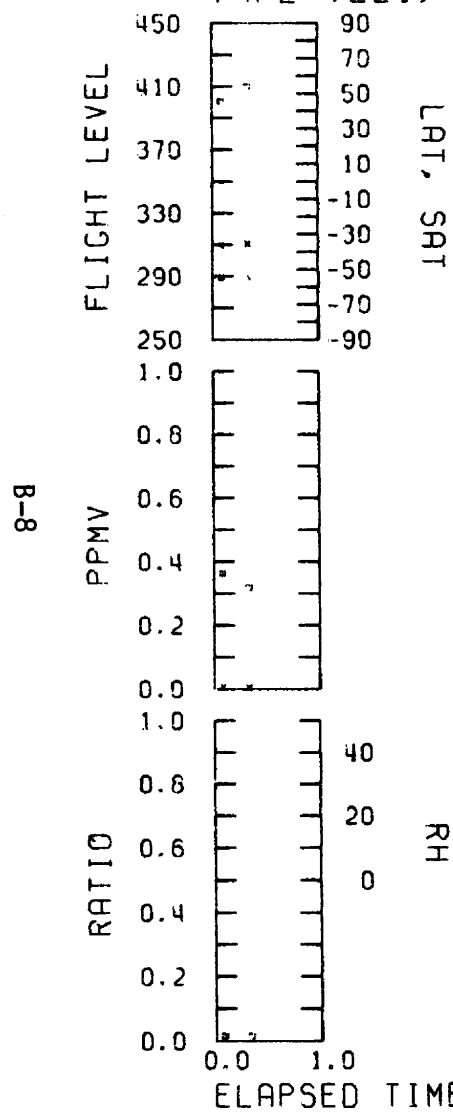
AKL TO SYD DEPARTURE 7 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 7



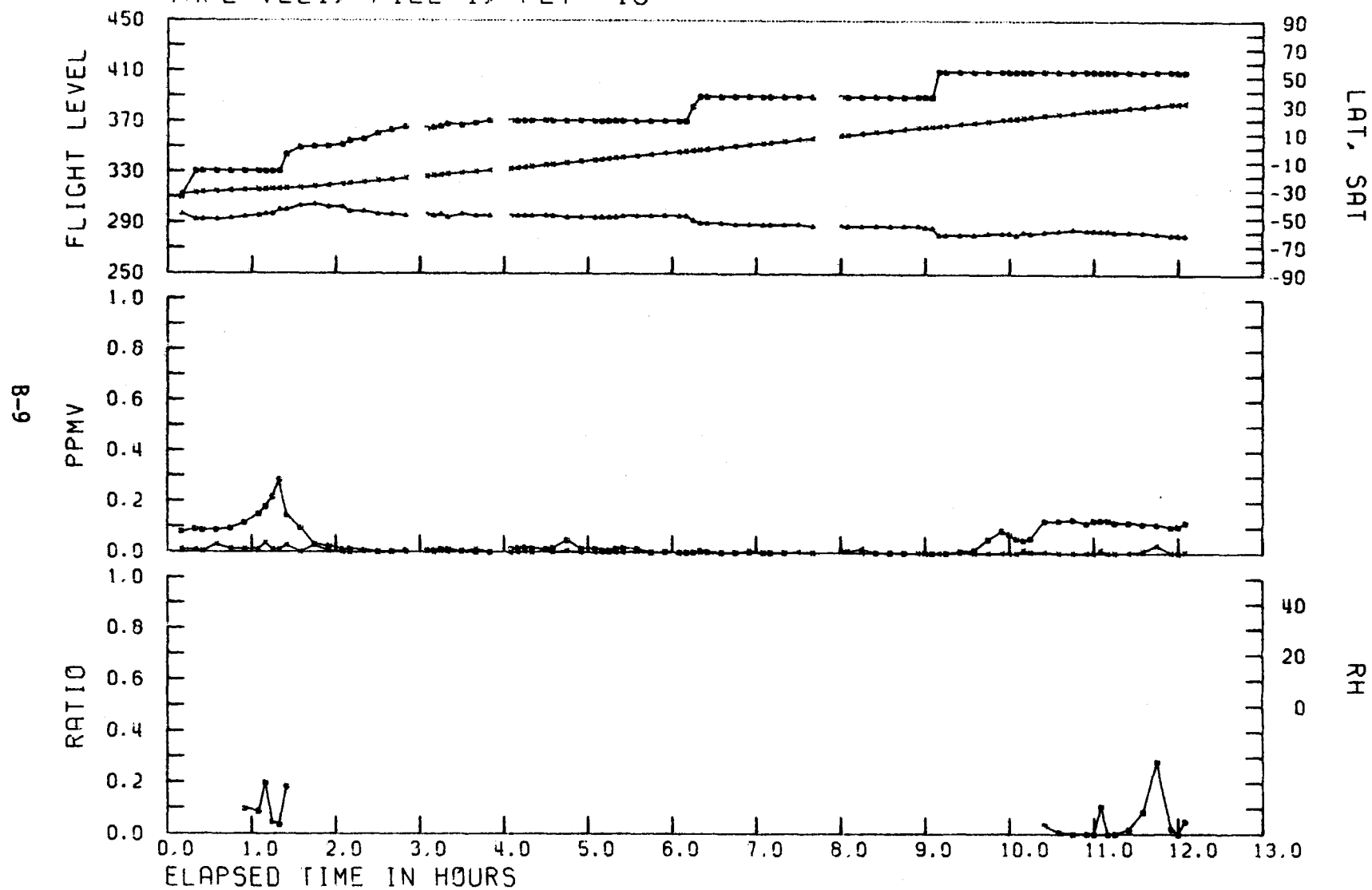
SYD TO MEL DEPARTURE 8 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 8



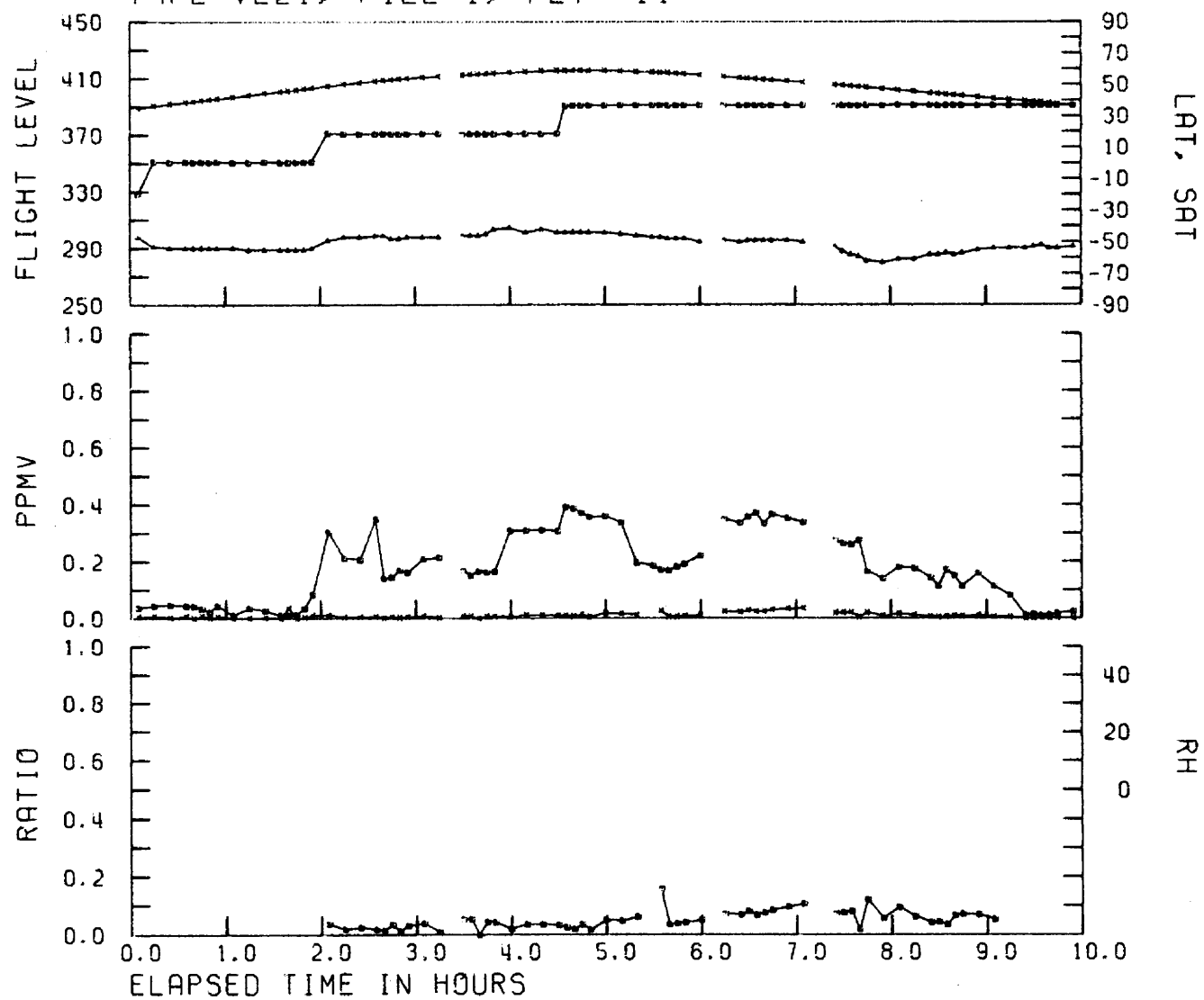
MEL TO SYD DEPARTURE 8 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 9



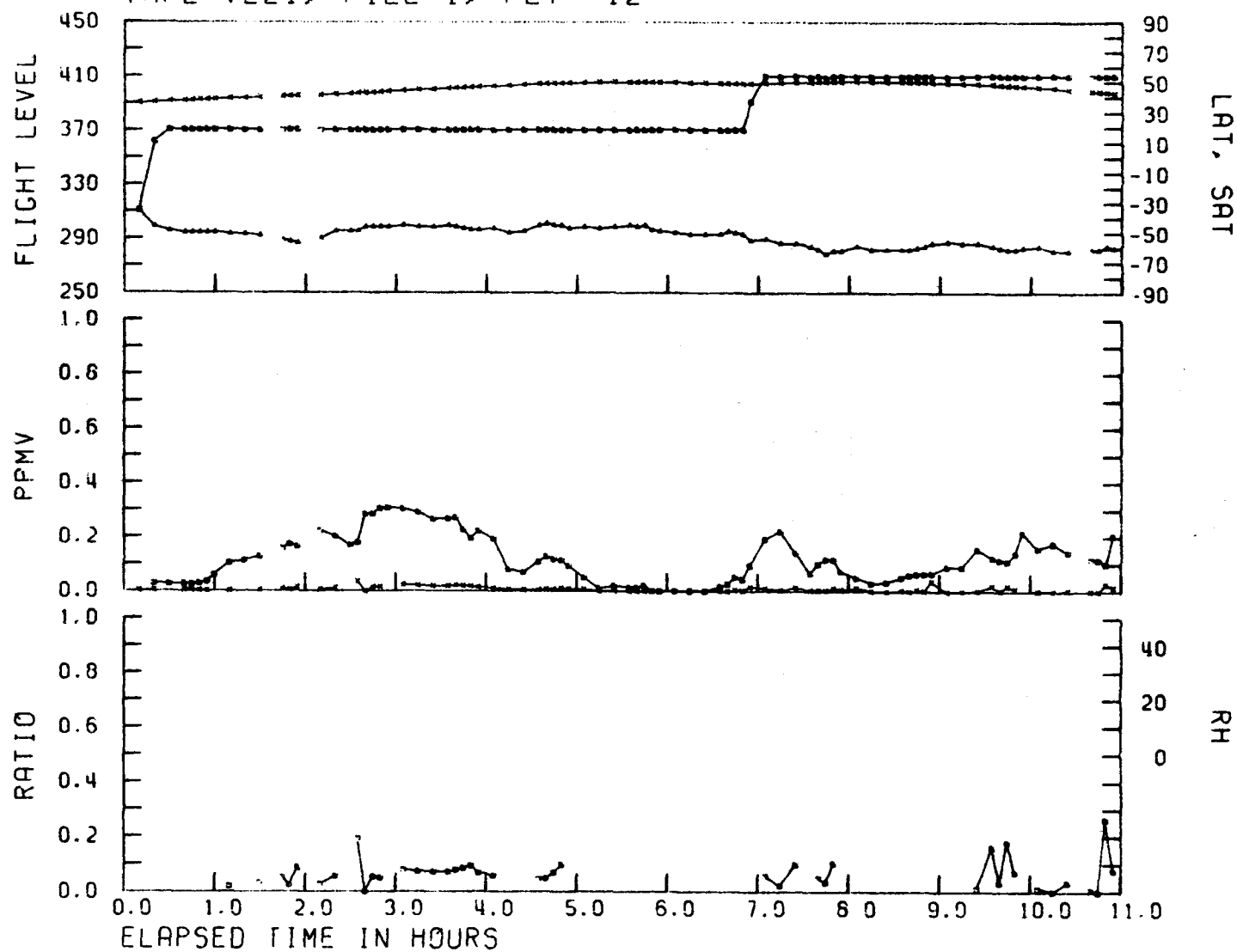
SYD TO LAX DEPARTURE 8 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 10



LAX TO NRT DEPARTURE 8 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 11

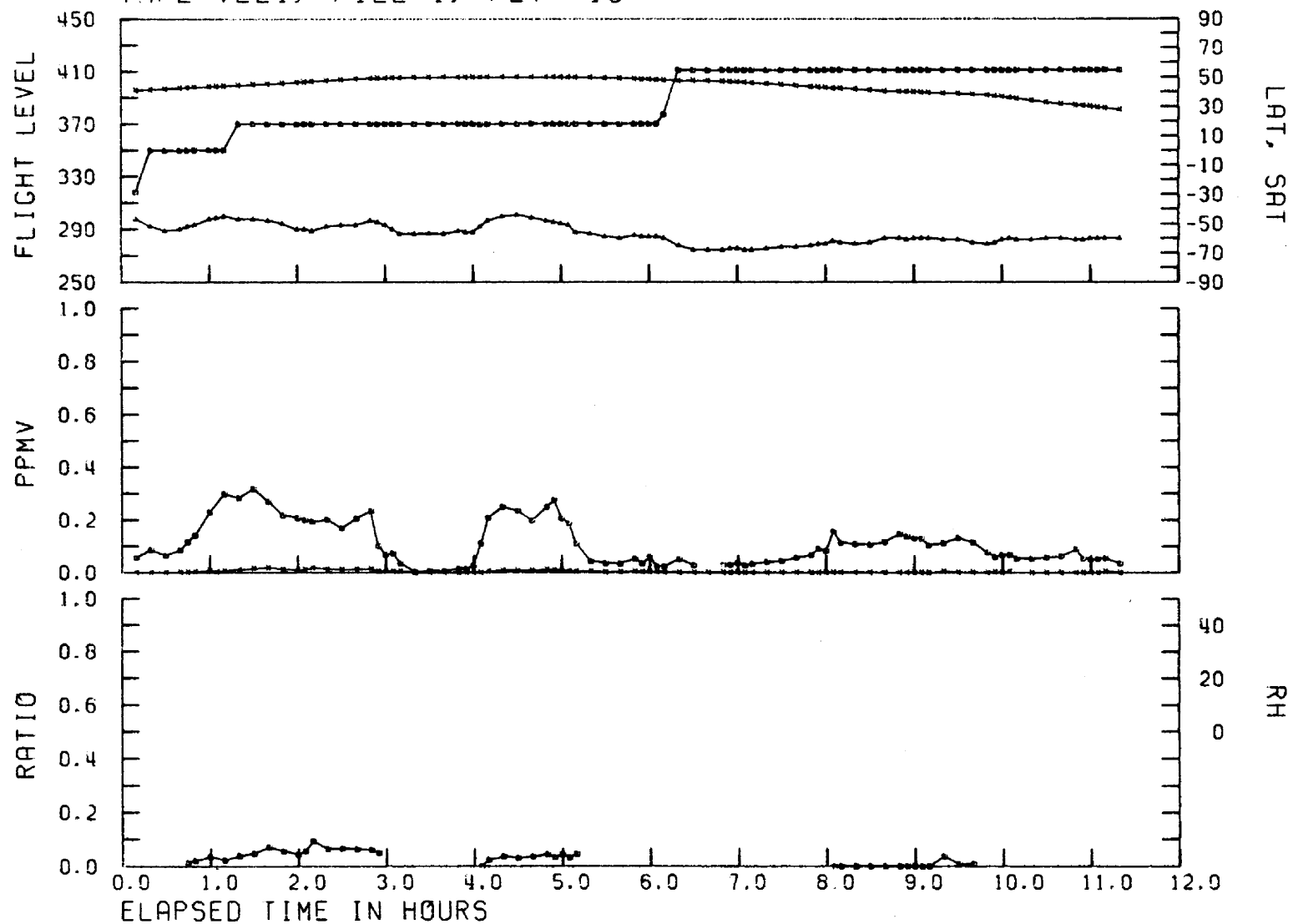


NRT TO JFK DEPARTURE 9 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 12

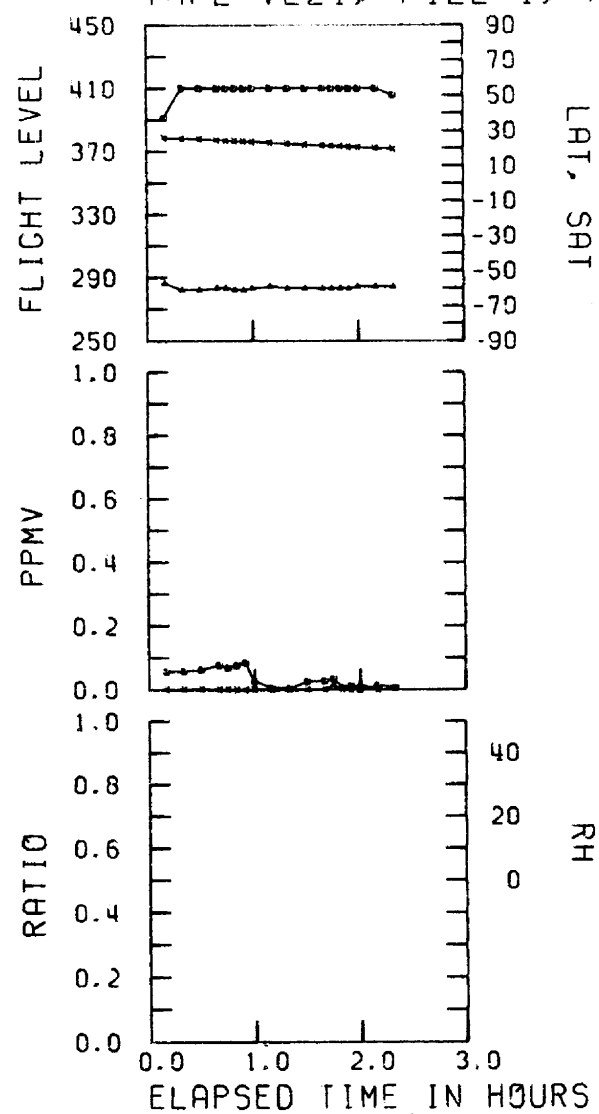


11-8
 8-11

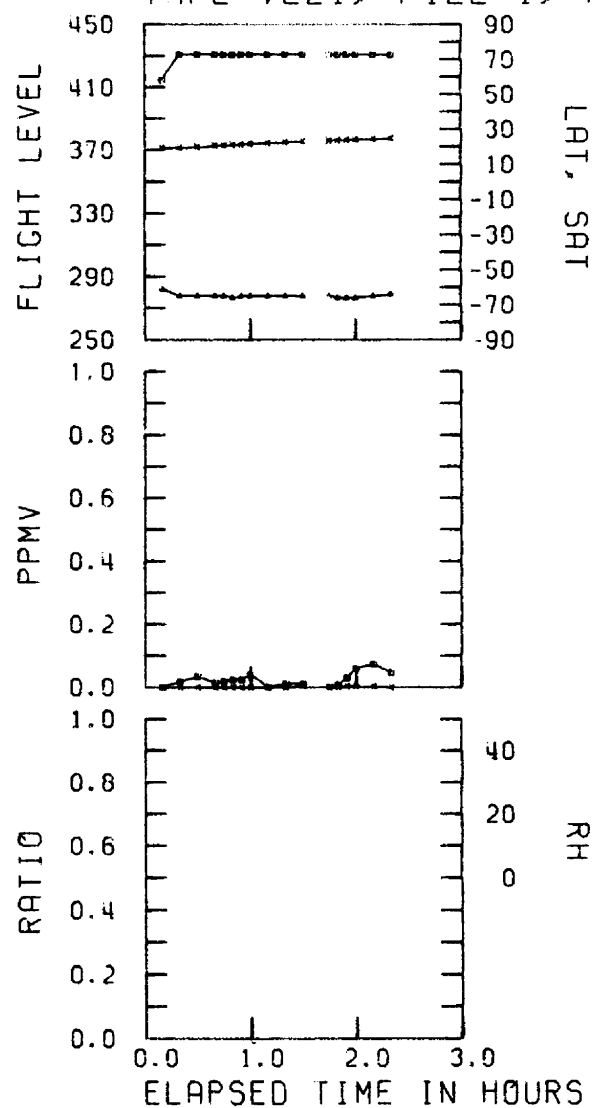
JFK TO BAH DEPARTURE 10 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 13



BAH TO BOM DEPARTURE 11 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 14

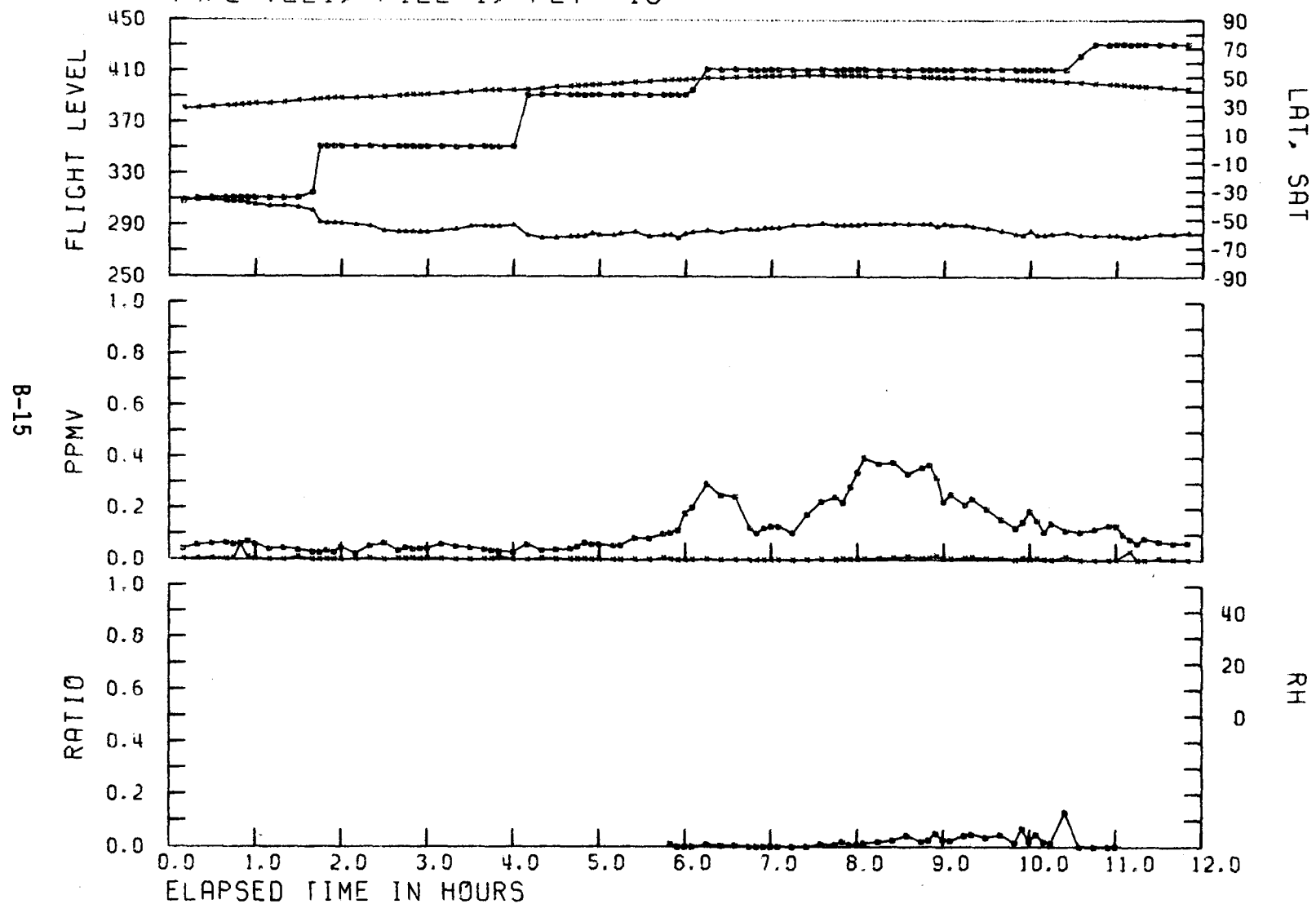


BOM TO BAH DEPARTURE 11 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 15

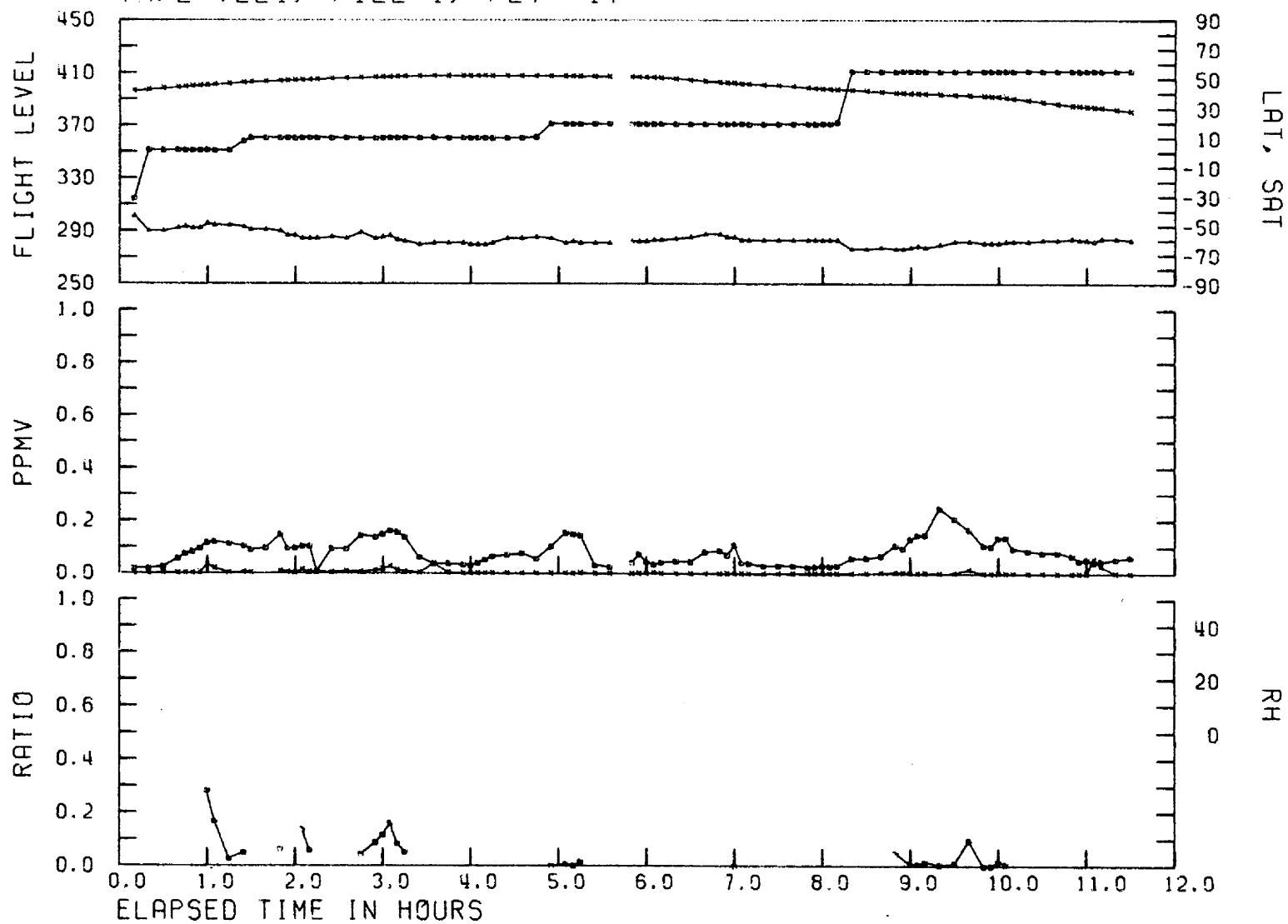


B-14

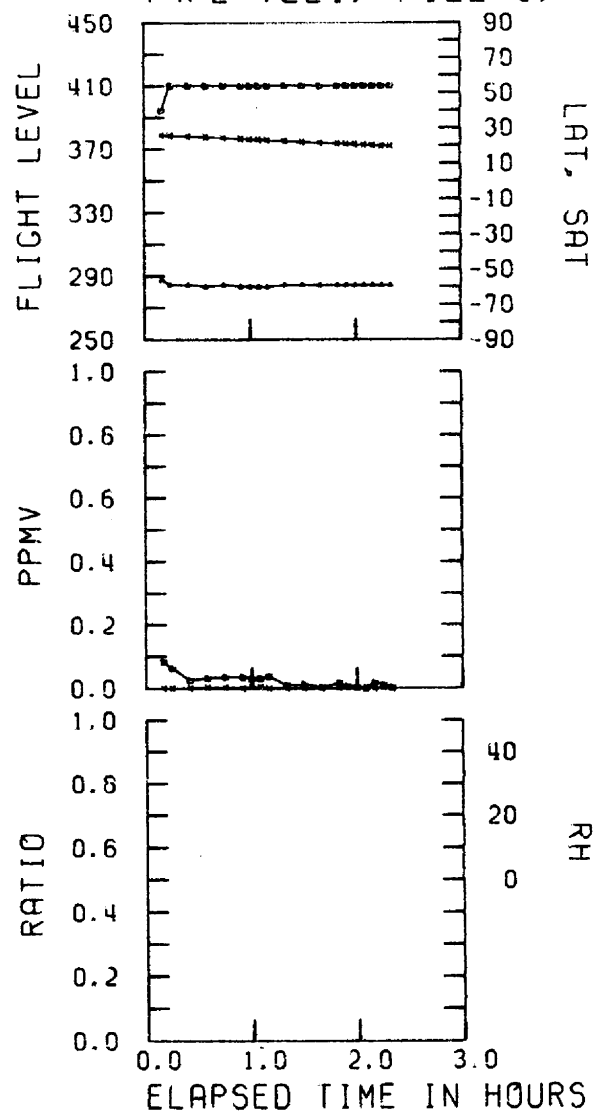
BAH TO JFK DEPARTURE 11 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 16



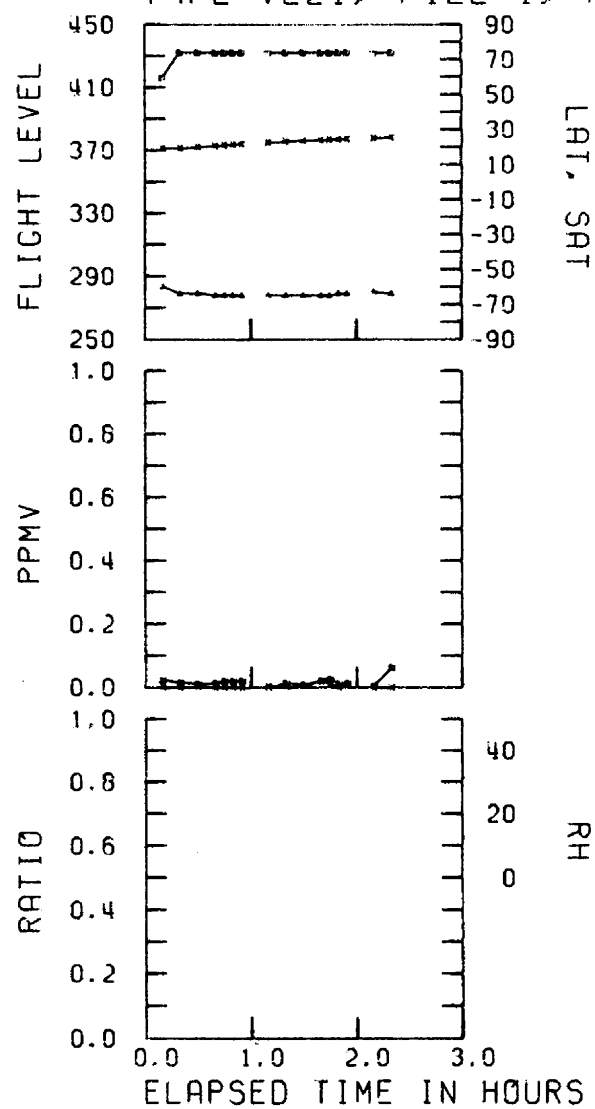
JFK TO BAH DEPARTURE 12 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 17



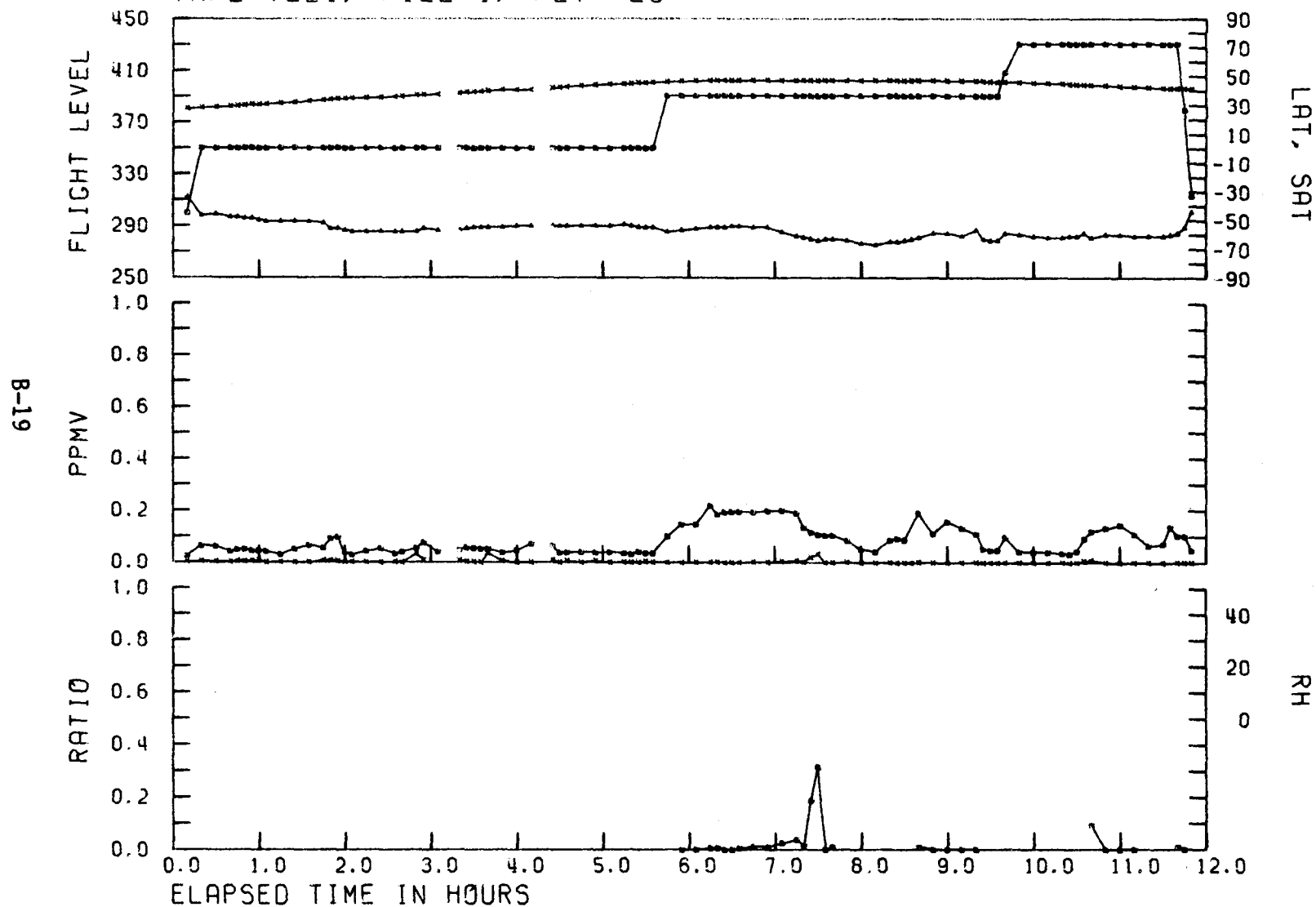
BAH TO BOM DEPARTURE 13 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 18



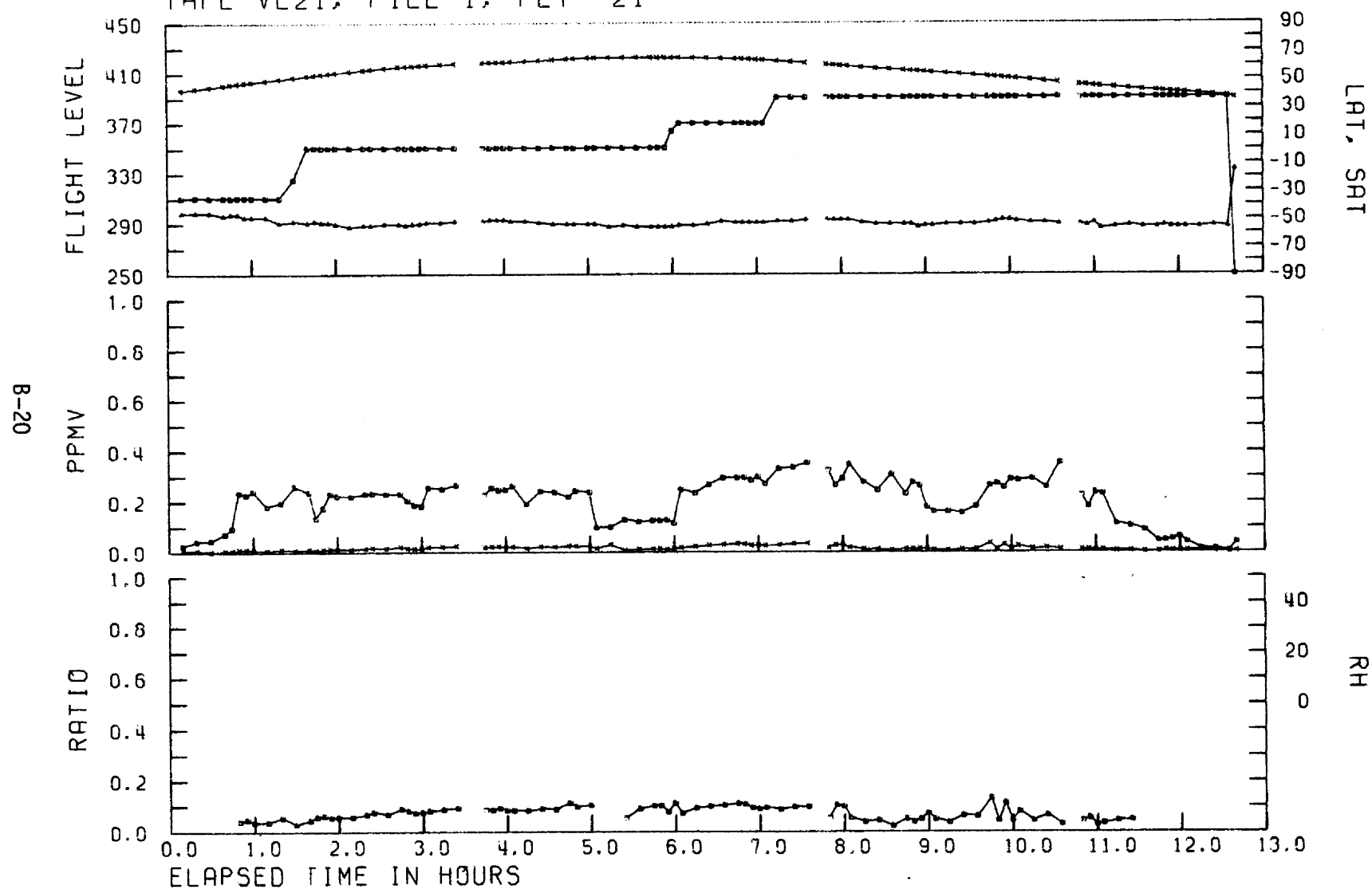
BOM TO BAH DEPARTURE 13 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 19



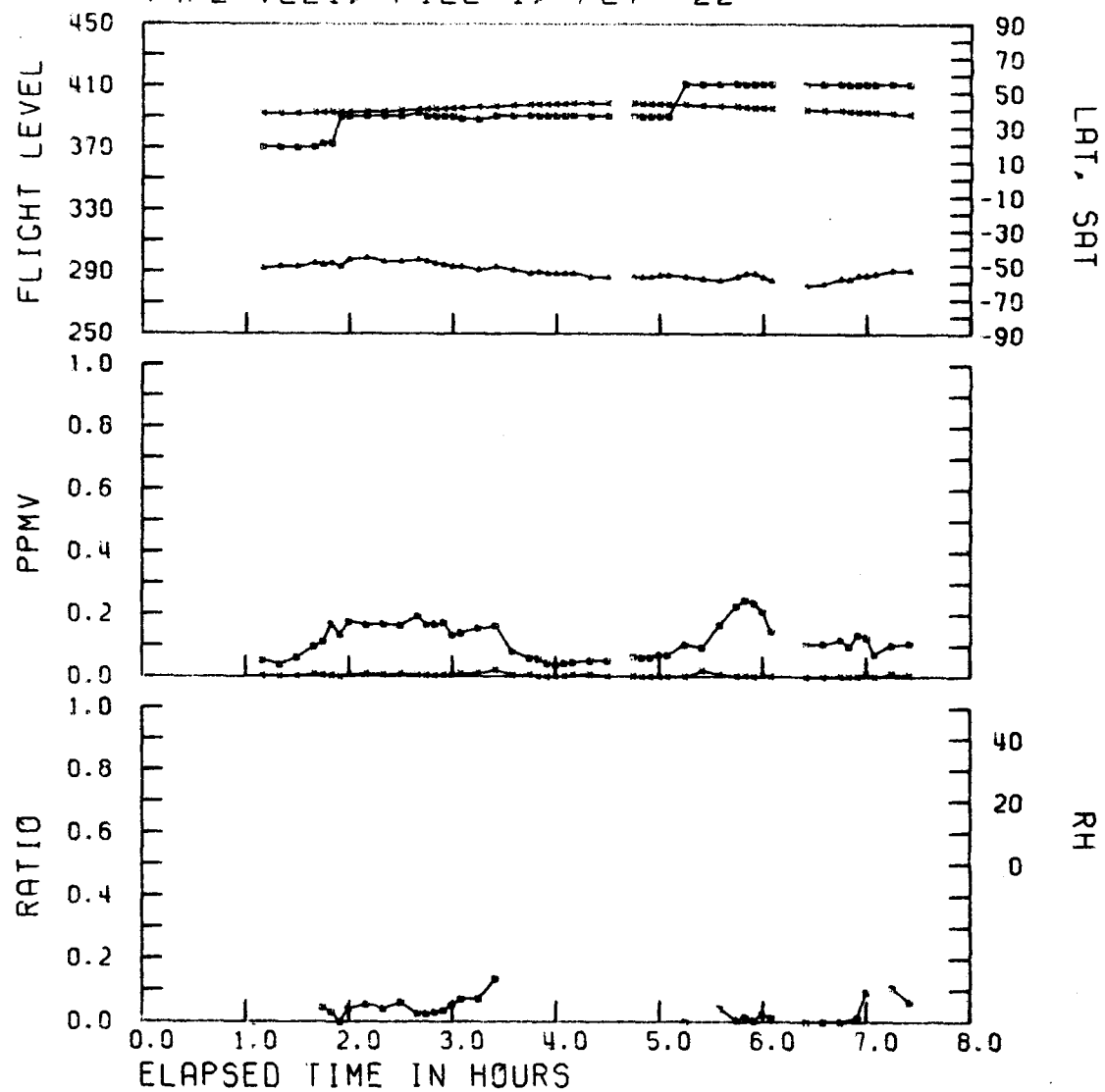
BAH TO JFK DEPARTURE 13 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 20



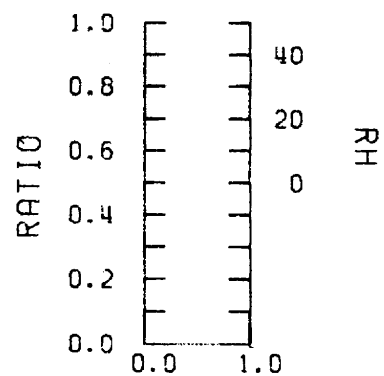
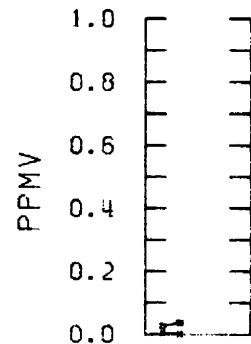
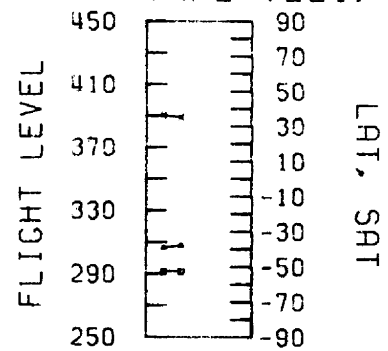
JFK TO NRT DEPARTURE 14 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 21



NRT TO SFO DEPARTURE 15 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 22



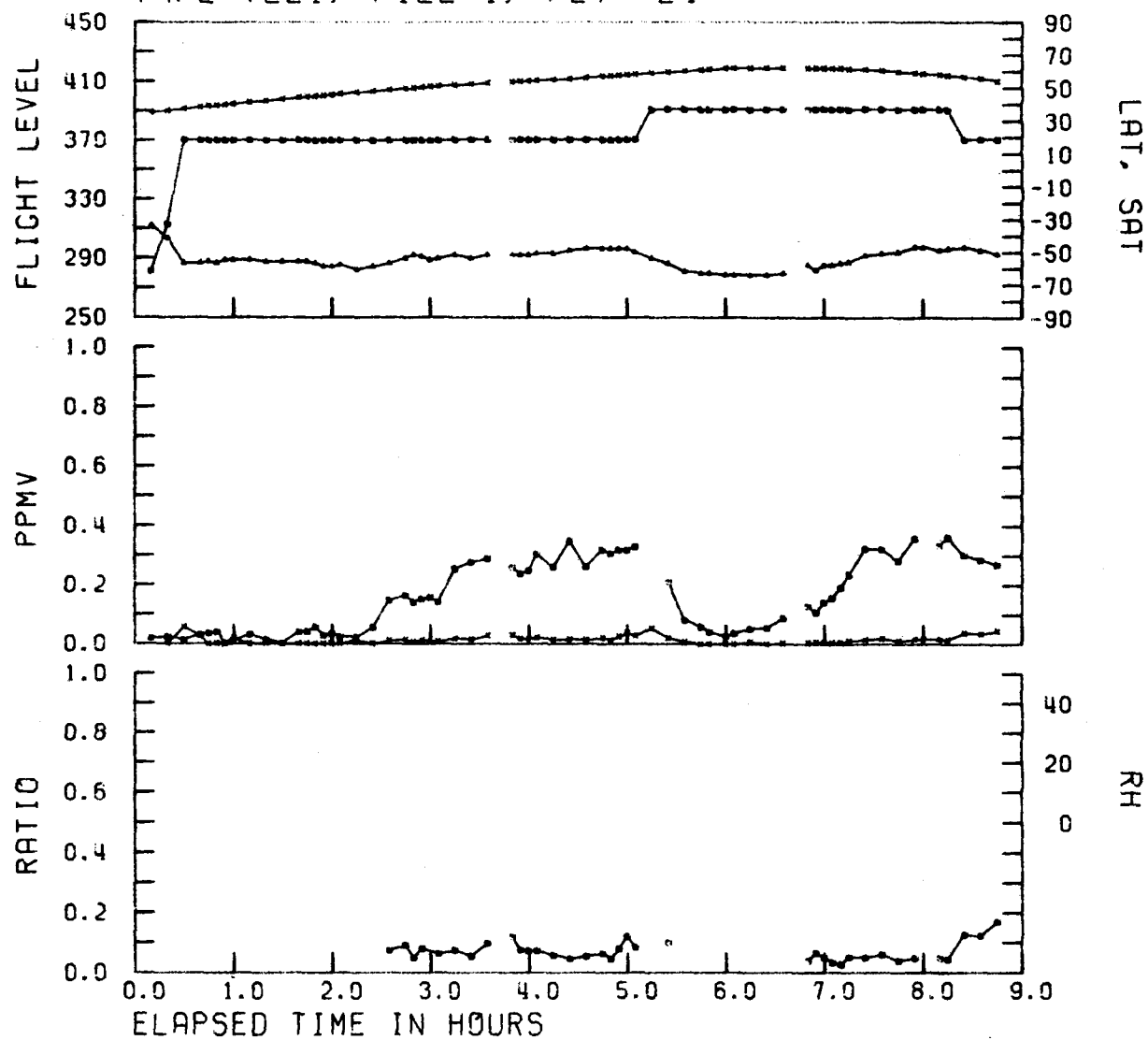
SFO TO LAX DEPARTURE 15 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 23



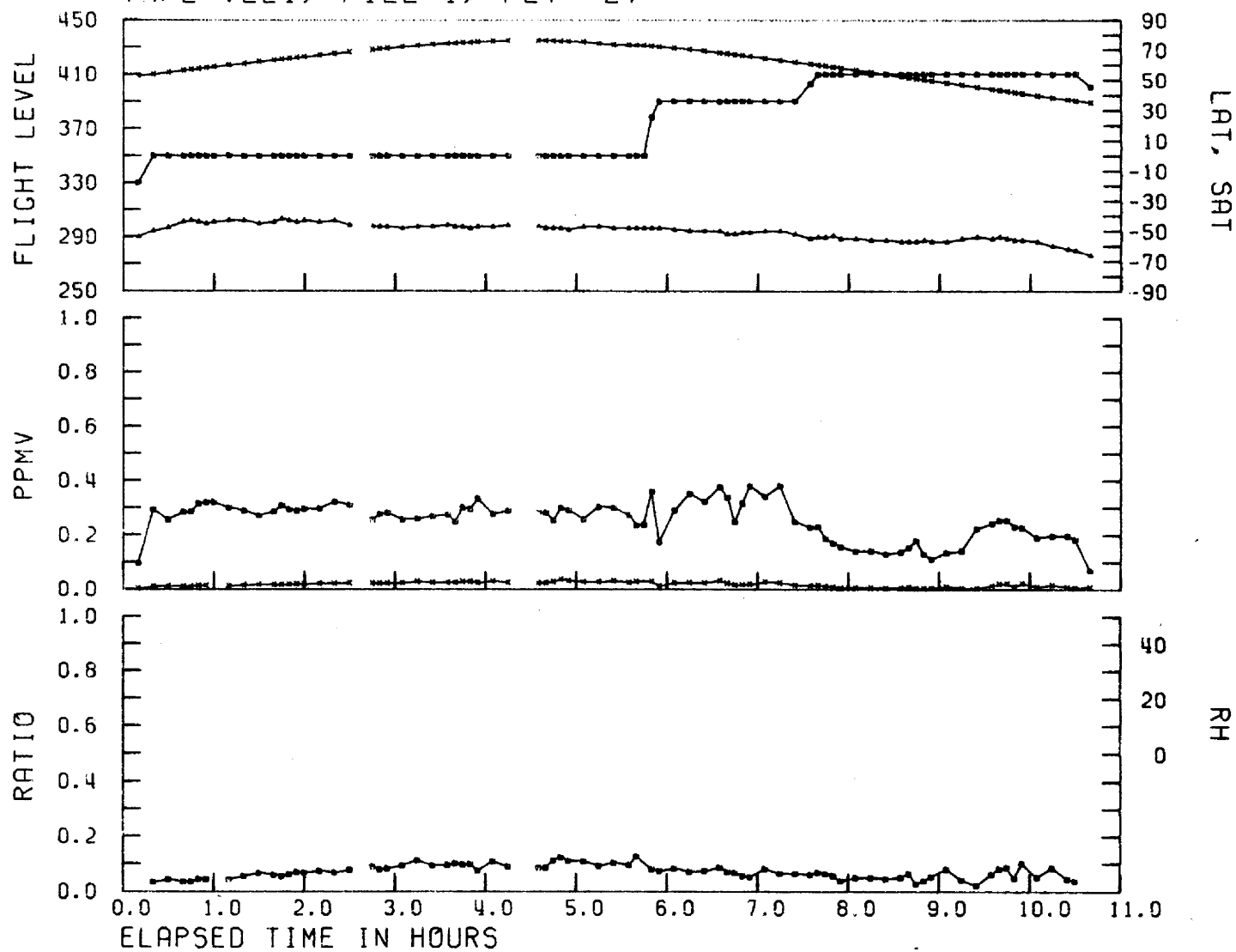
TIME IN HOURS

B-22

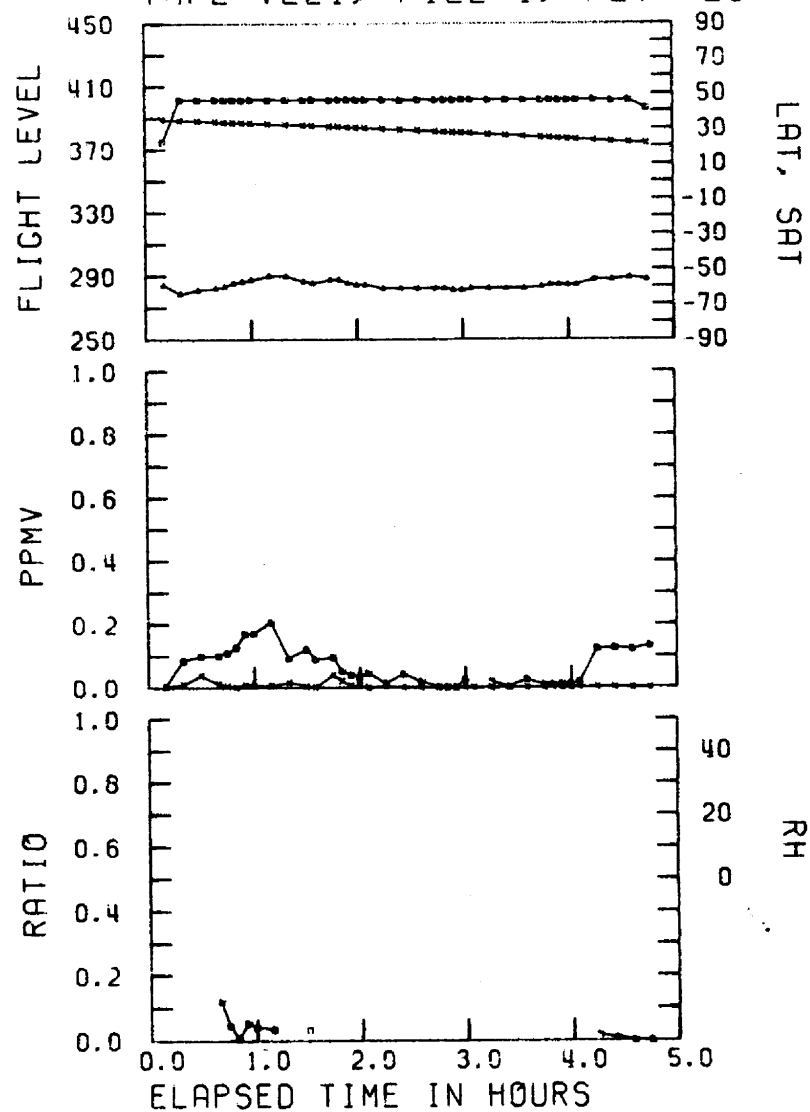
LAX TO LHR DEPARTURE 15 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 24



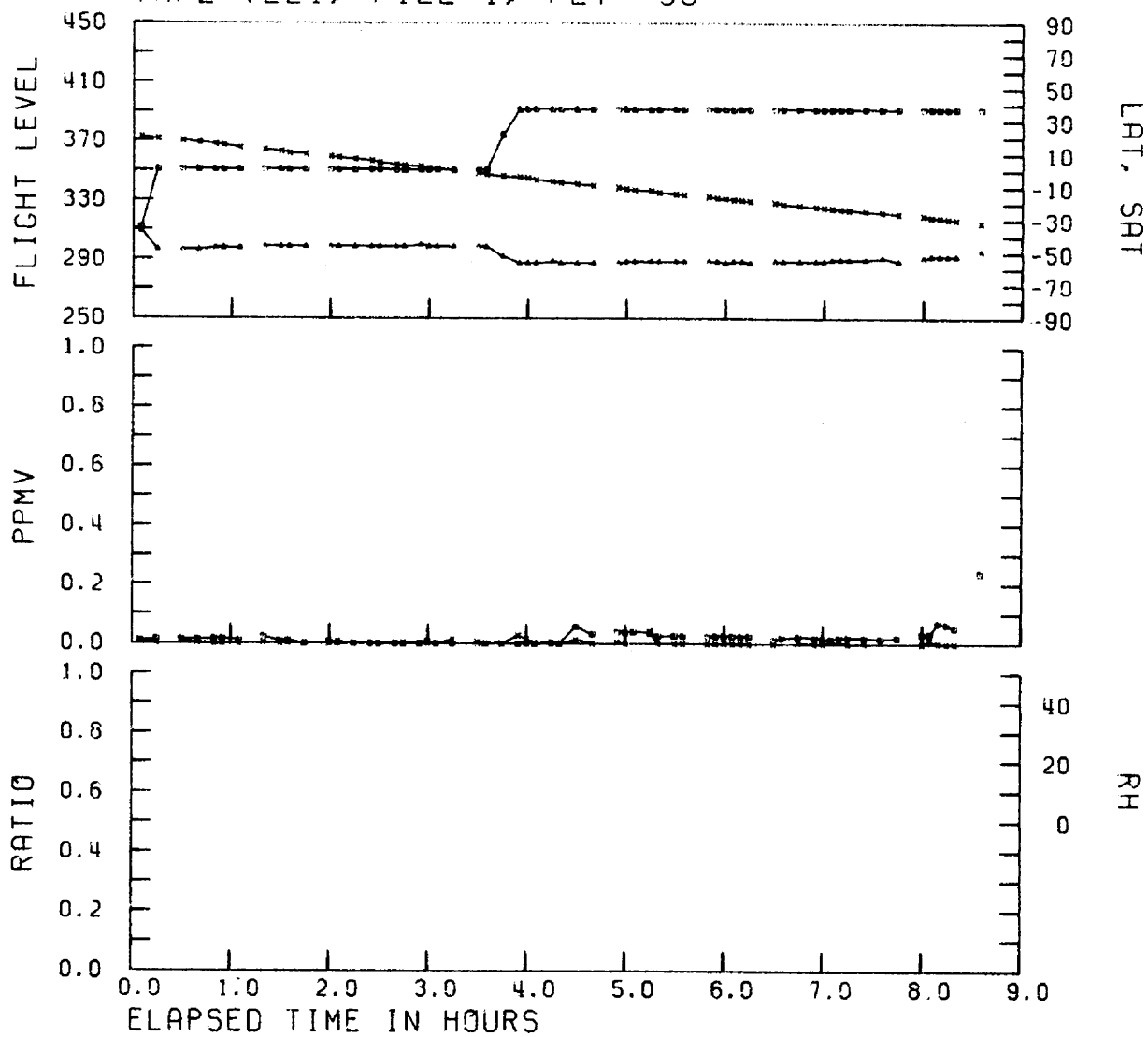
LHR TO LAX DEPARTURE 16 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 27



LAS TO HNL DEPARTURE 17 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 29

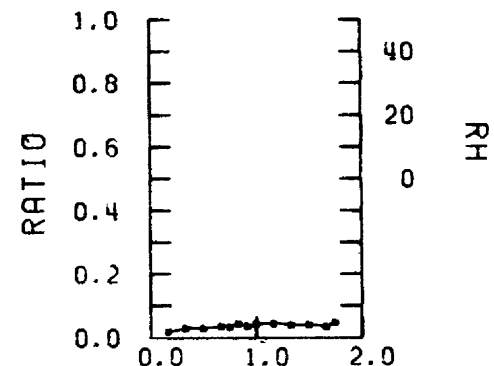
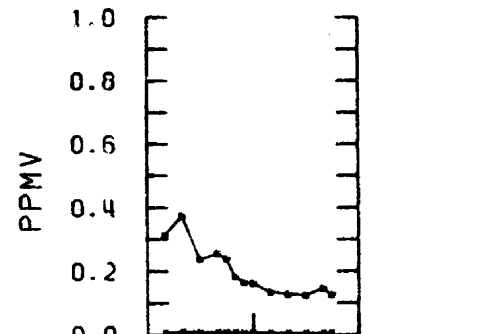
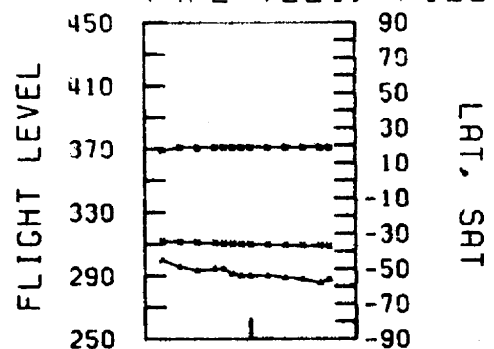


HNL TO SYD DEPARTURE 17 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 30



B-26

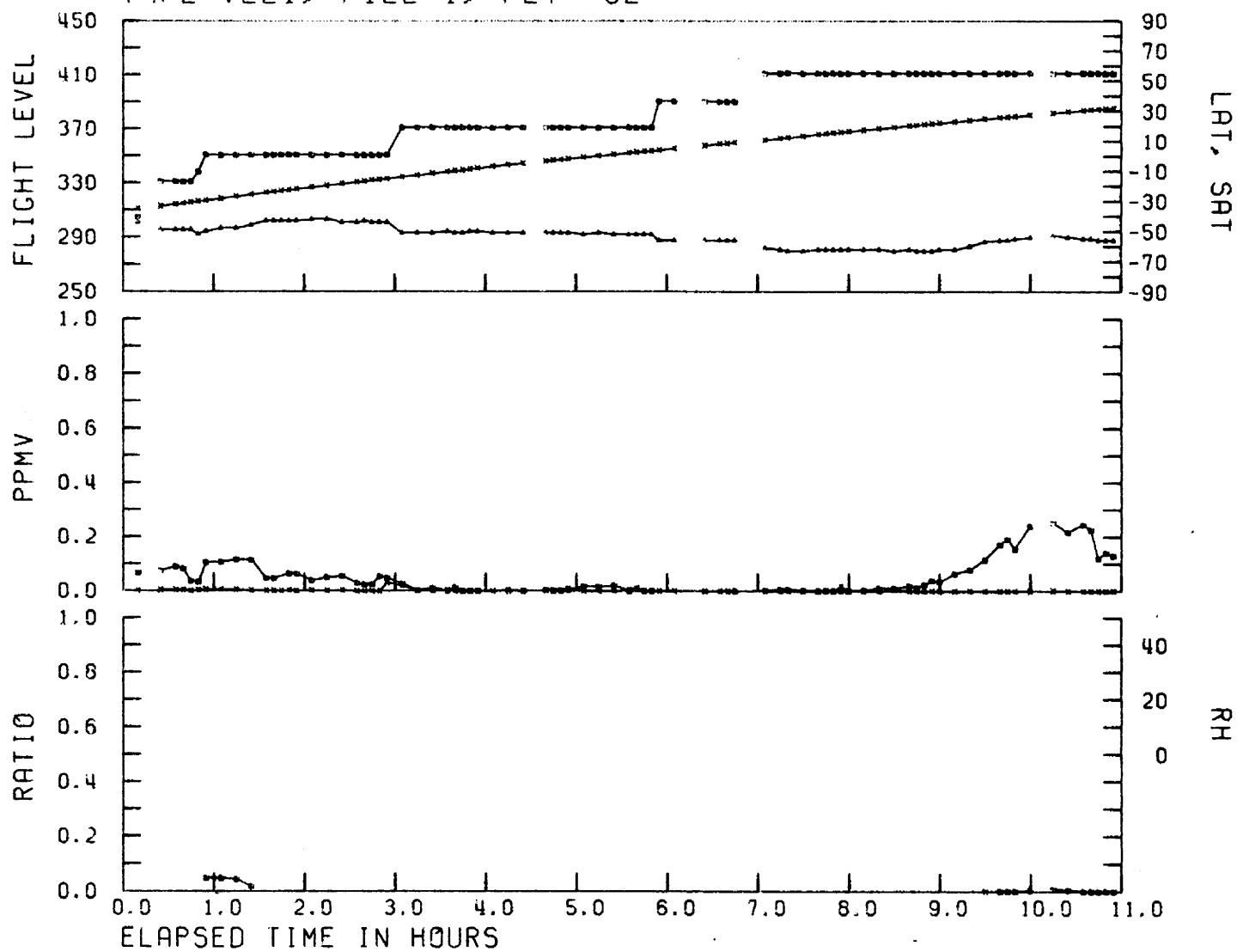
SYD TO AKL DEPARTURE 18 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 31



ELAPSED TIME IN HOURS

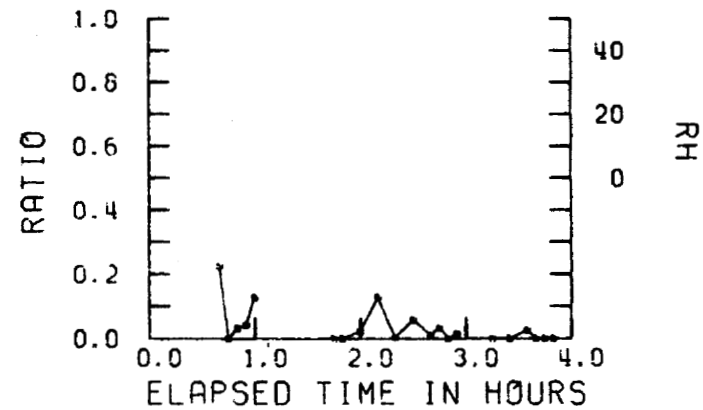
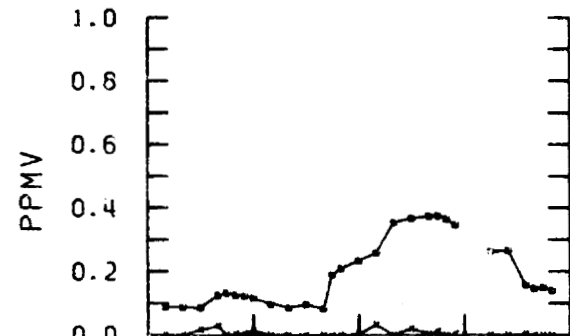
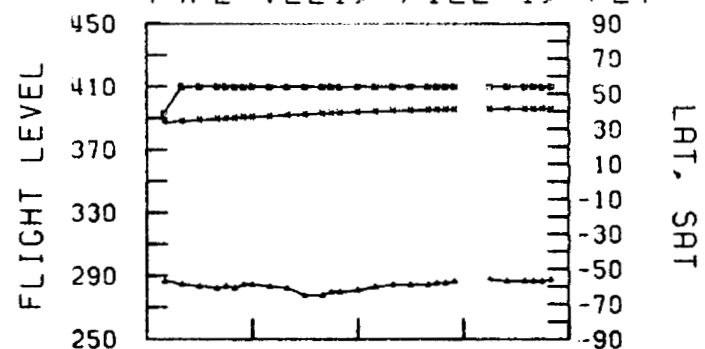
B-27

AKL TO LAX DEPARTURE 18 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 32



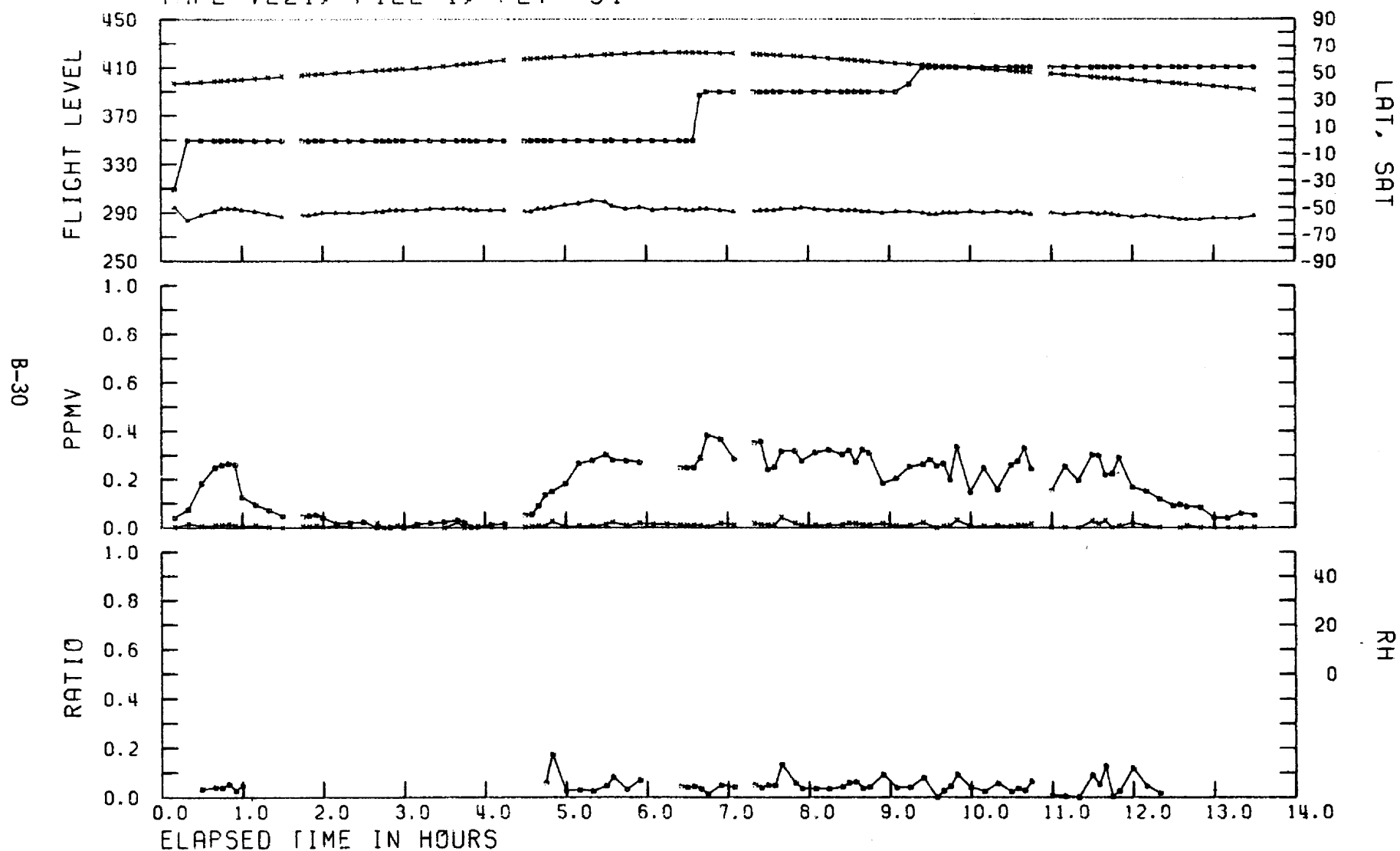
B-28

LAX TO JFK DEPARTURE 18 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 33

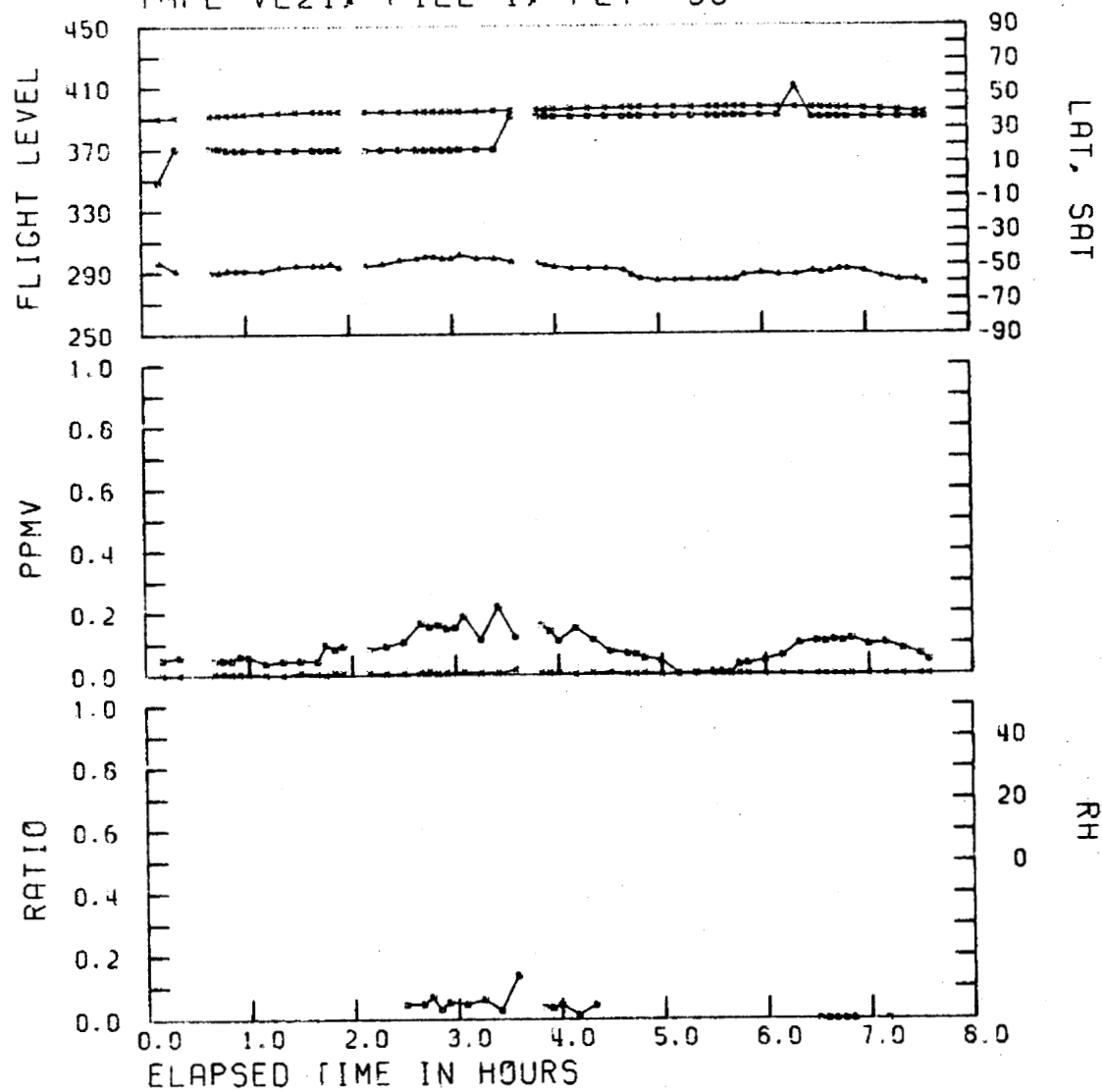


B-29

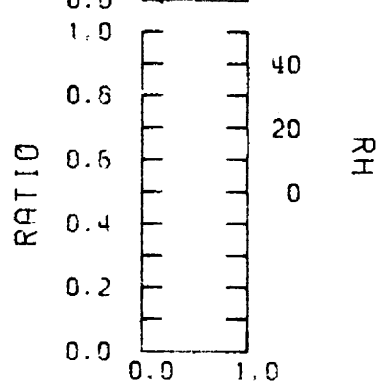
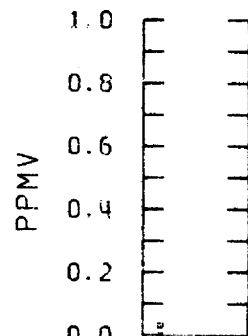
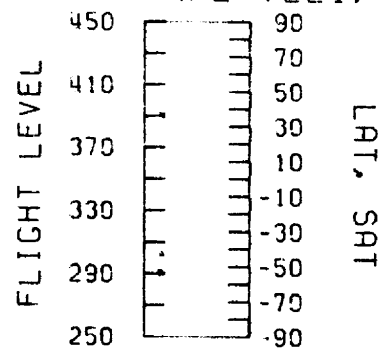
JFK TO NRT DEPARTURE 19 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 34



NRT TO SFO DEPARTURE 20 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 35



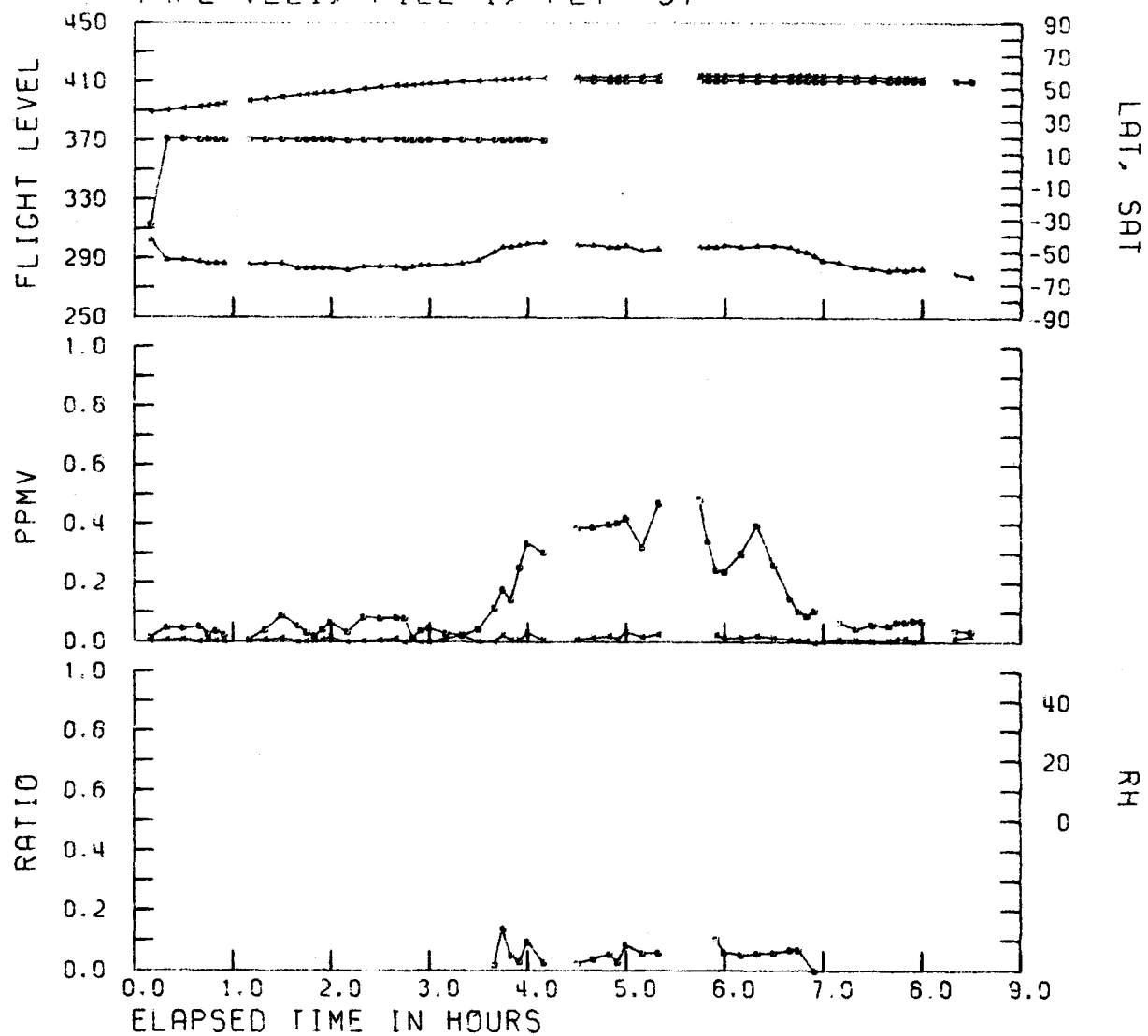
SFO TO LAX DEPARTURE 20 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 36



ELAPSED TIME IN HOURS

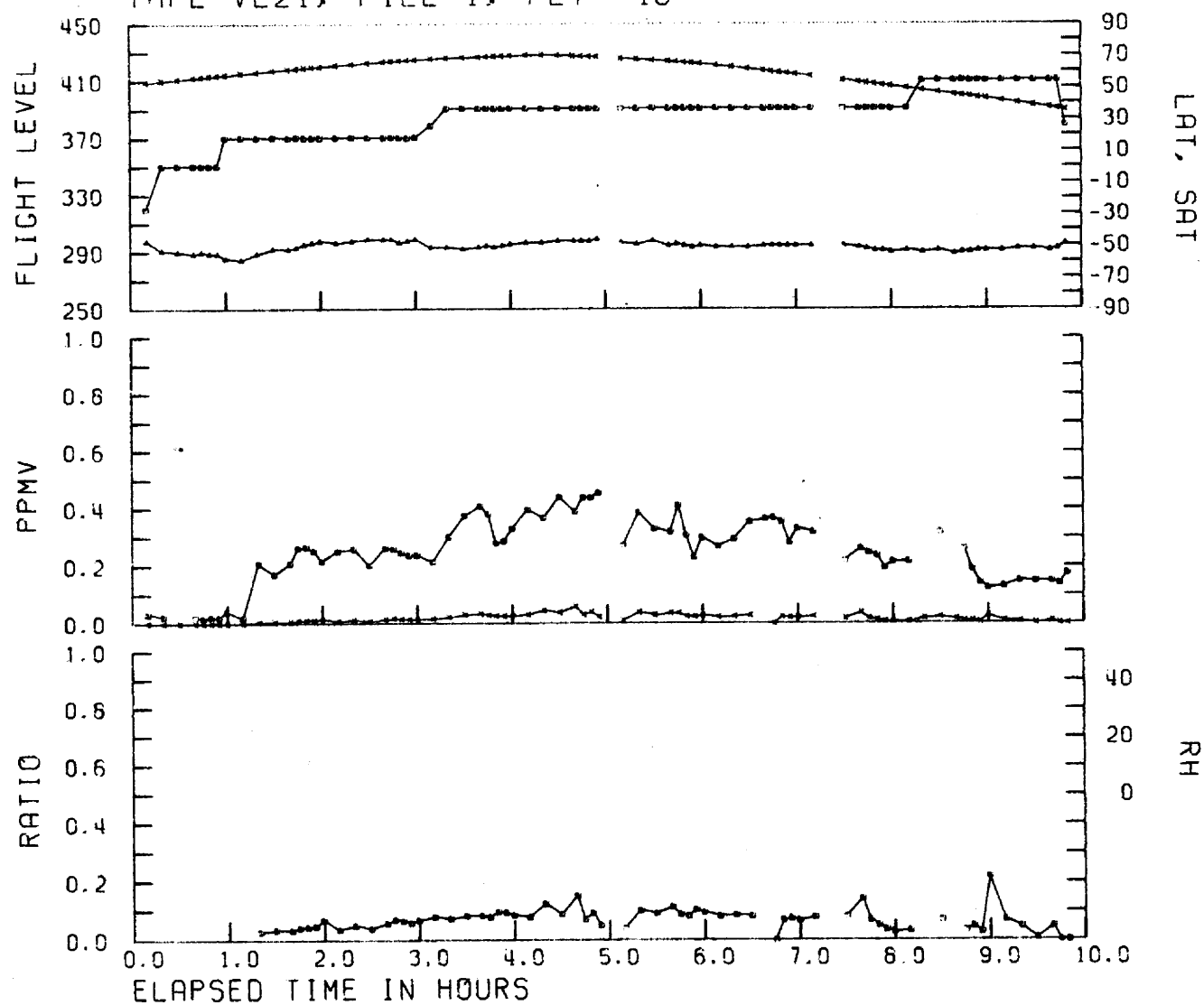
B-32

LAX TO LHR DEPARTURE 20 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 37

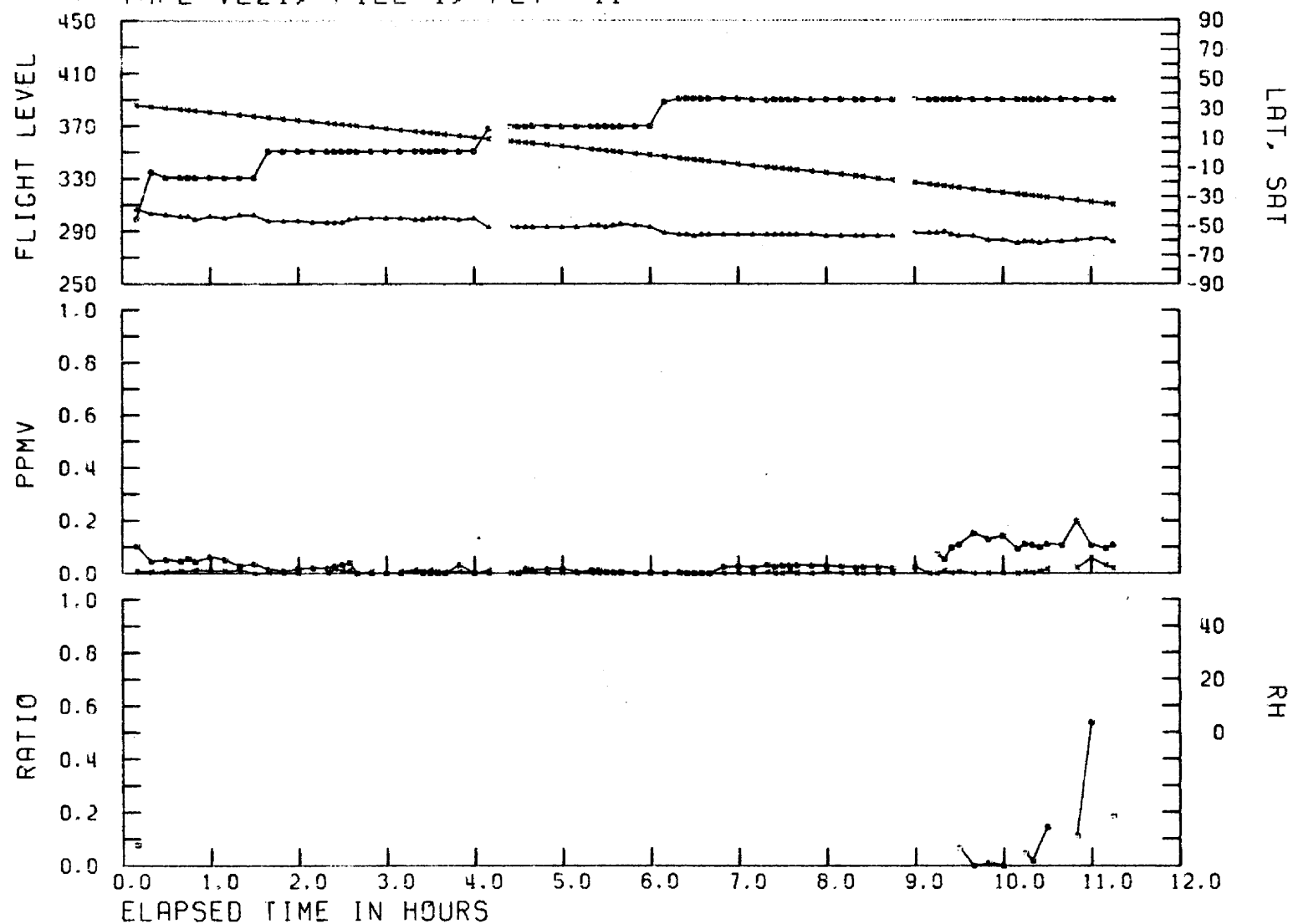


B-33

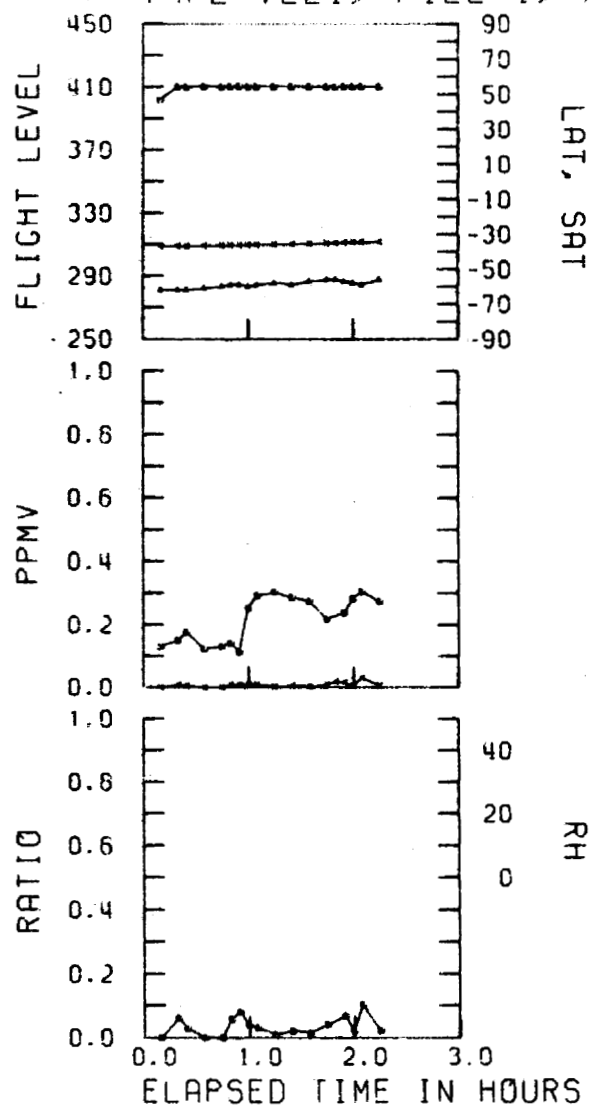
LHR TO LAX DEPARTURE 21 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 40



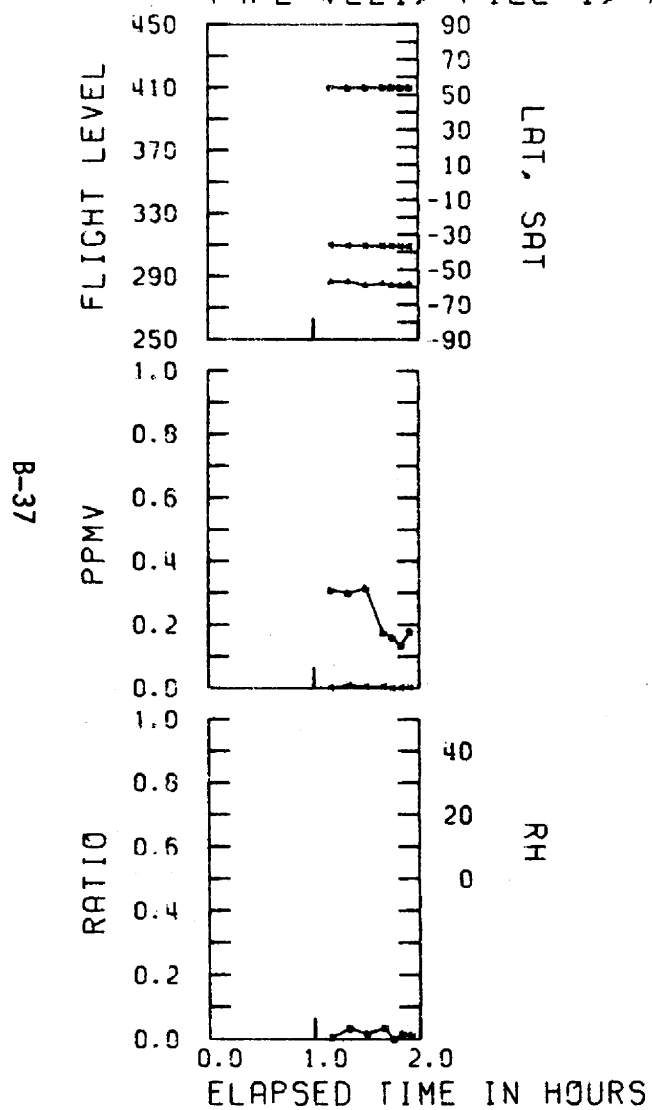
LAX TO AKL DEPARTURE 22 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 41



AKL TO SYD DEPARTURE 22 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 42

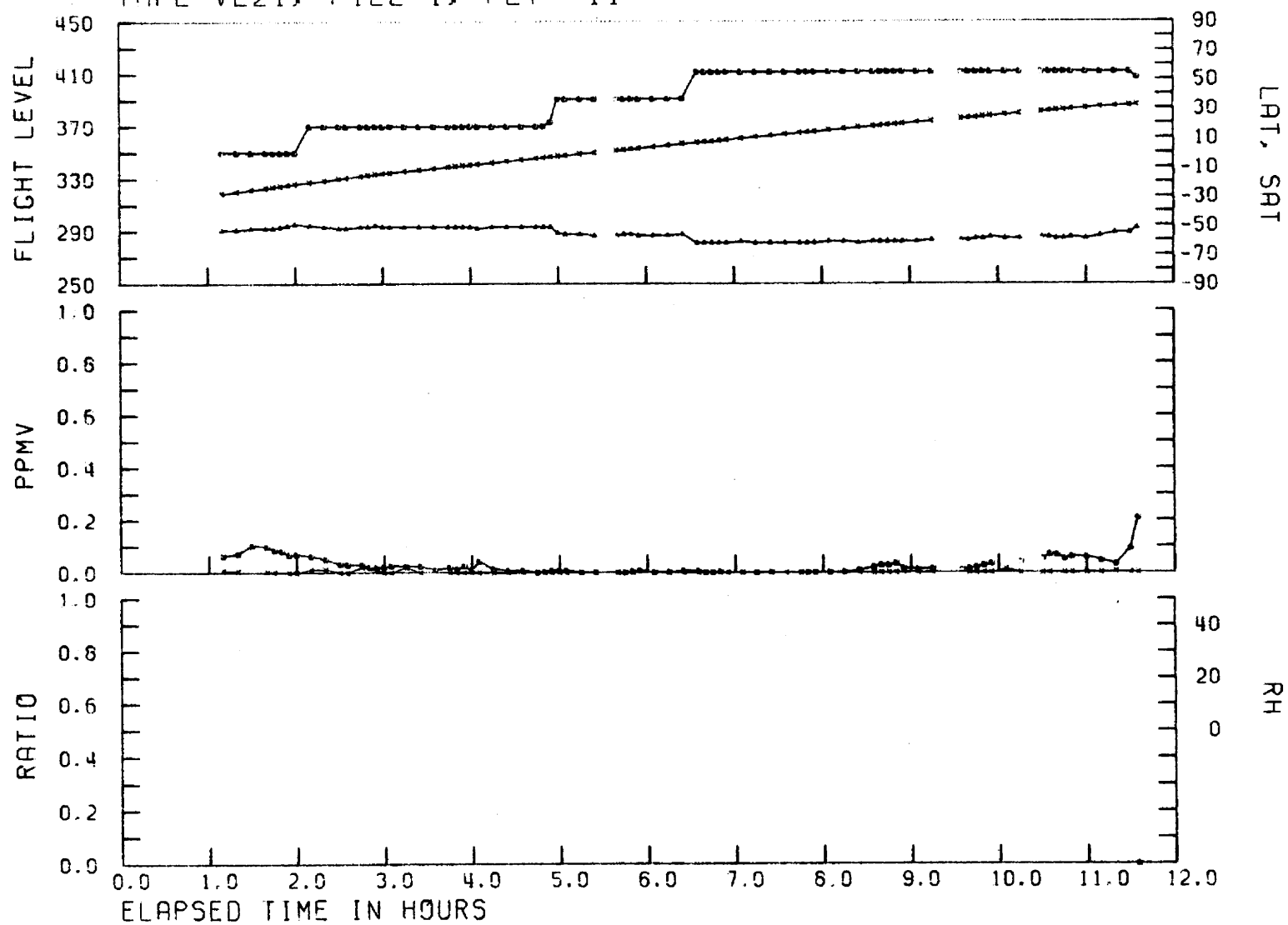


SYD TO AKL DEPARTURE 23 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 43

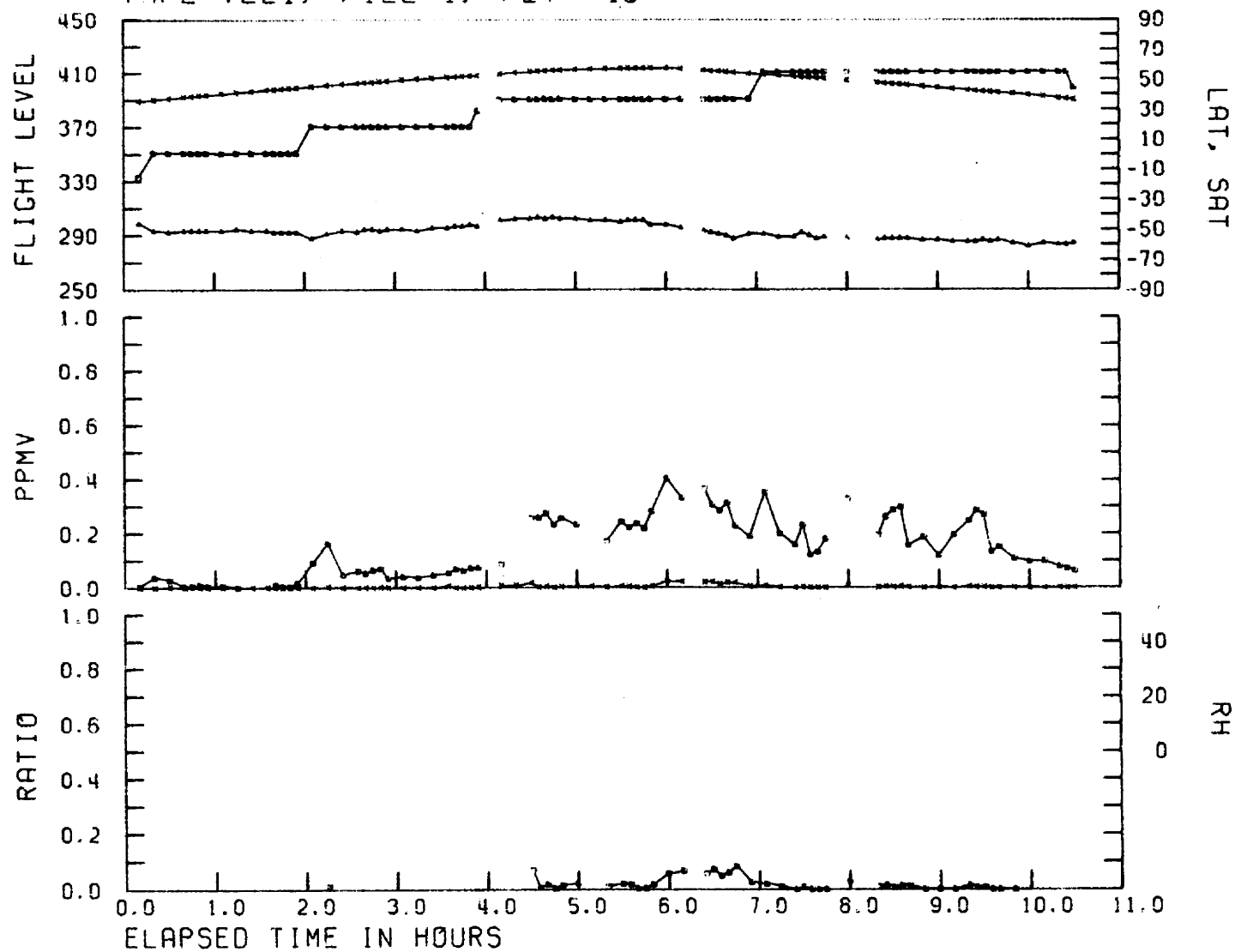


AKL TO LAX DEPARTURE 23 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 44

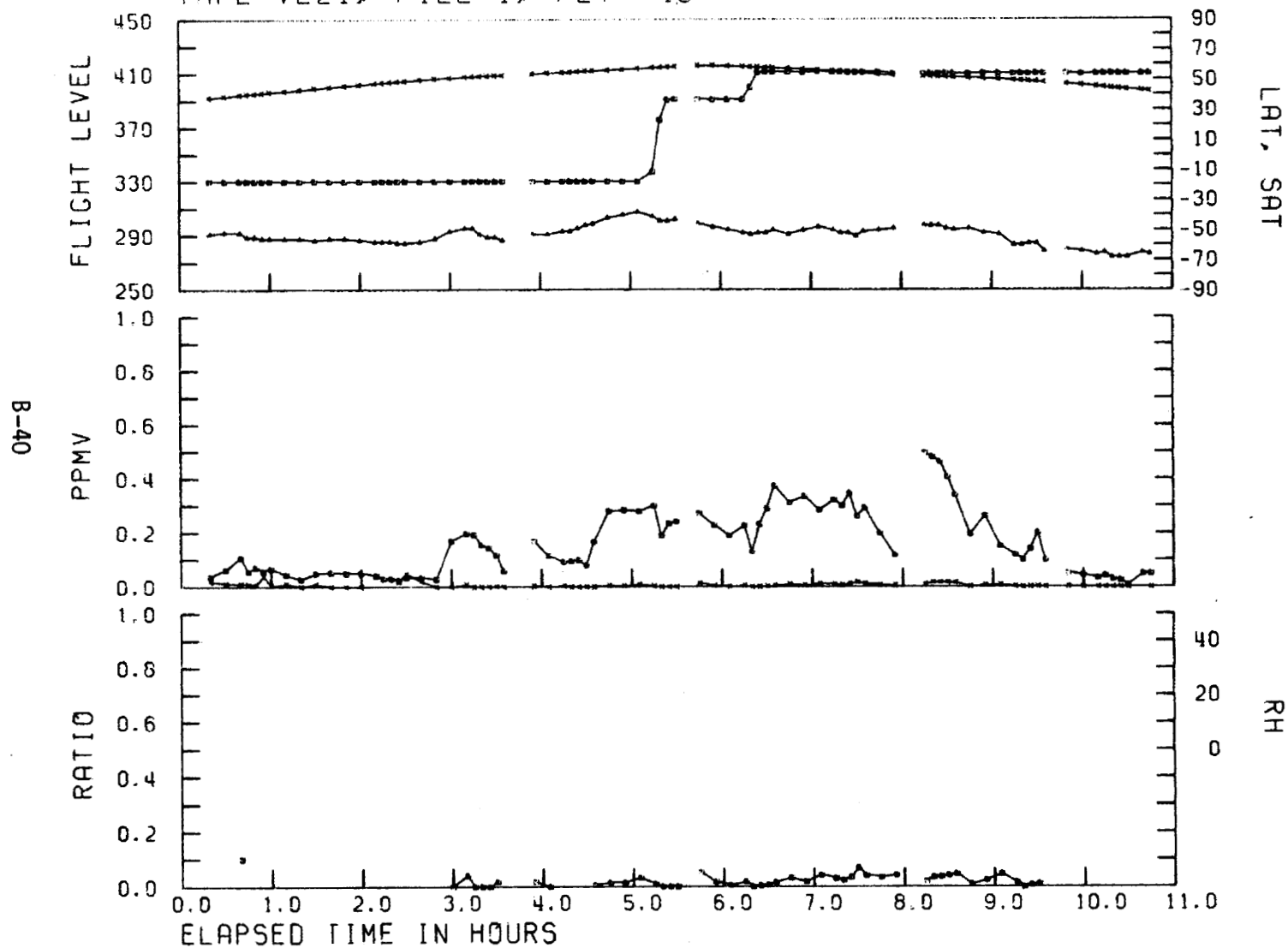
B-38



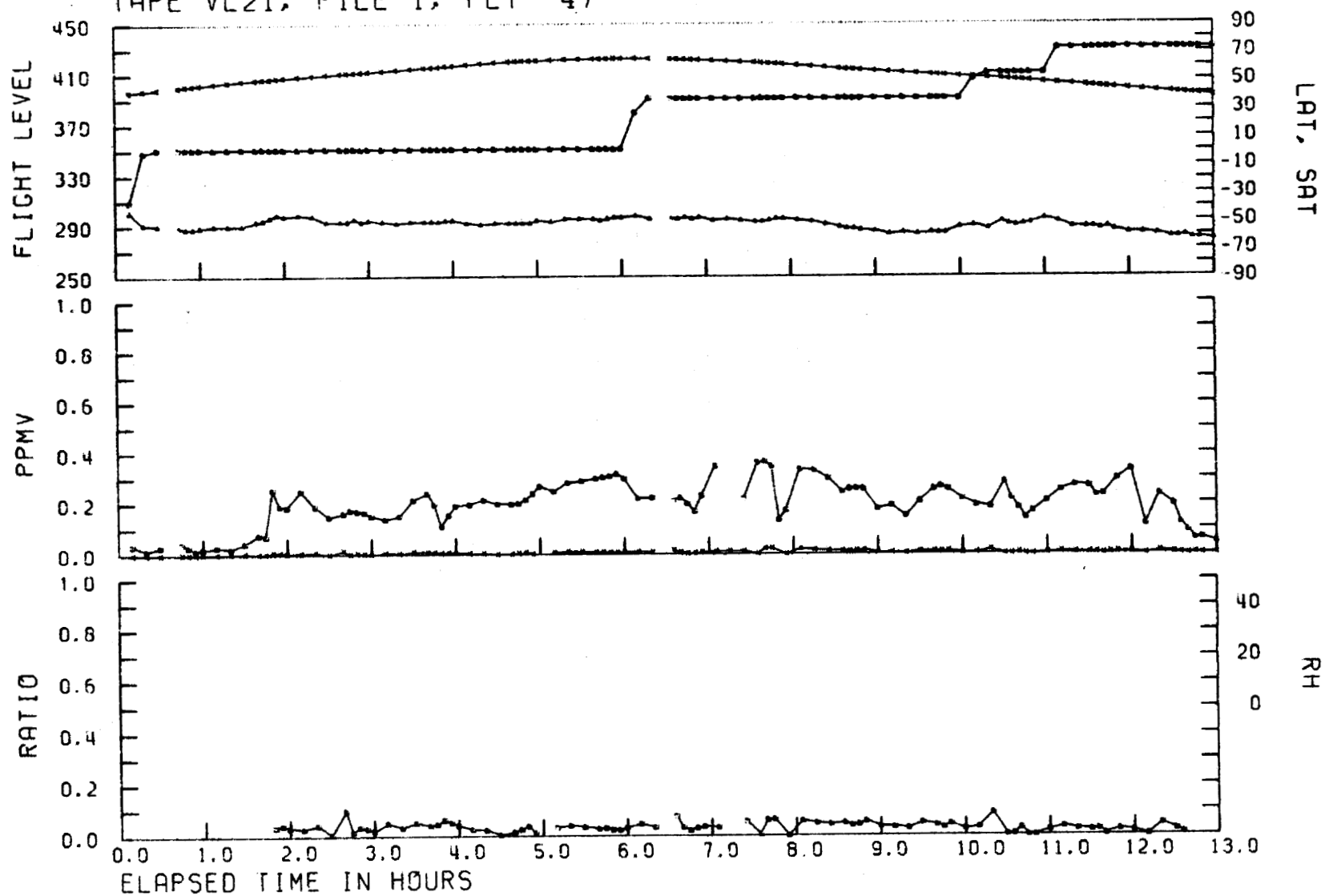
LAX TO NRT DEPARTURE 24 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 45



NRT TO JFK DEPARTURE 24 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 46

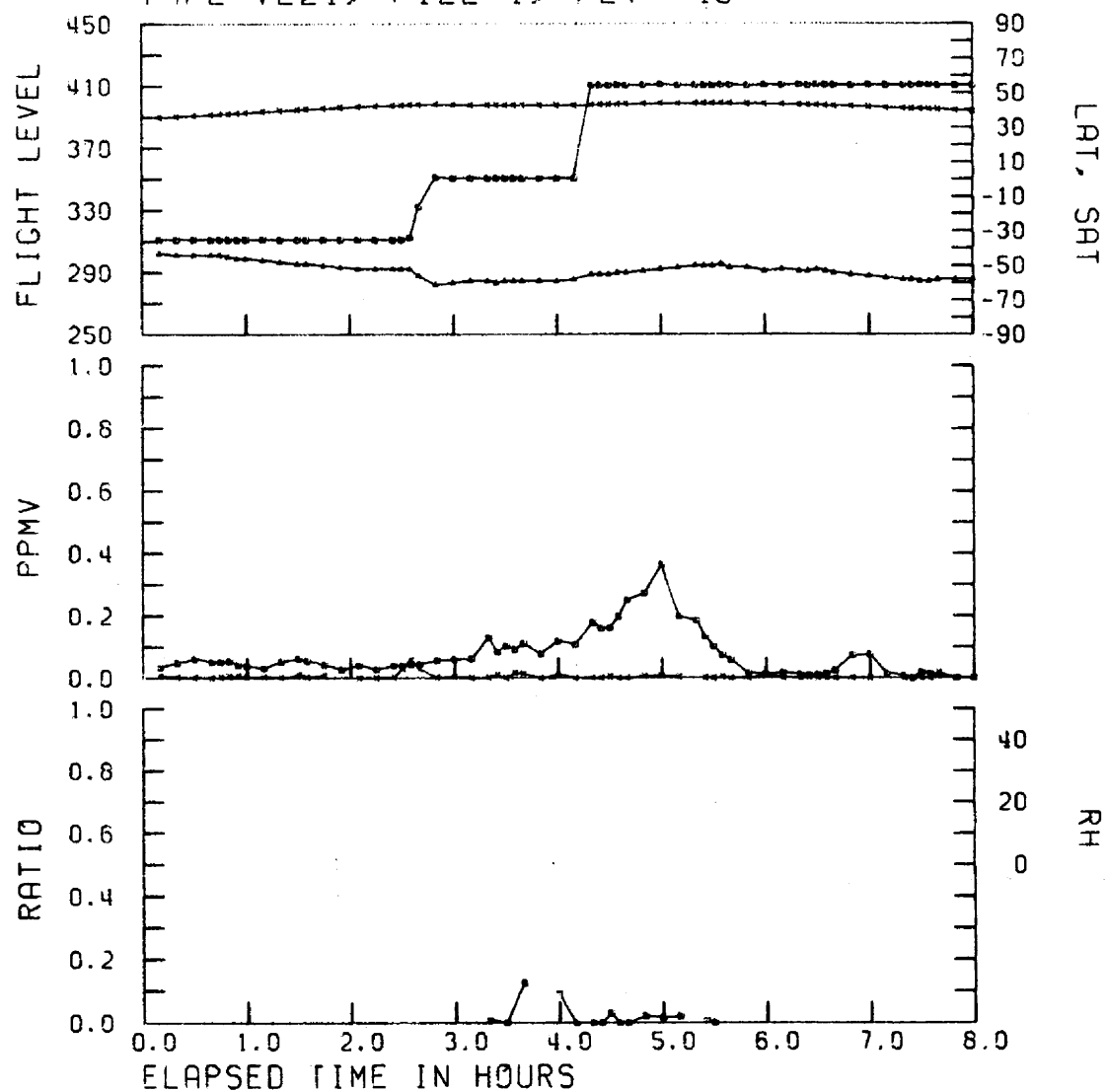


JFK TO NRT DEPARTURE 25 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 47

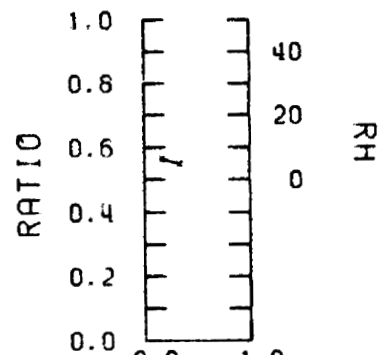
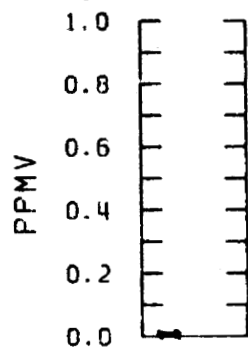
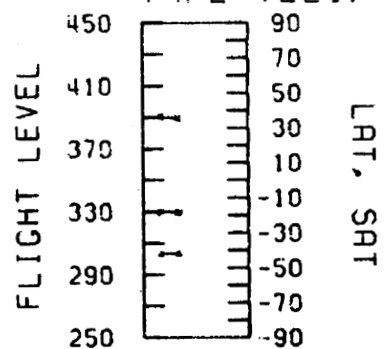


B-41

NRT TO SFO DEPARTURE 26 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 48



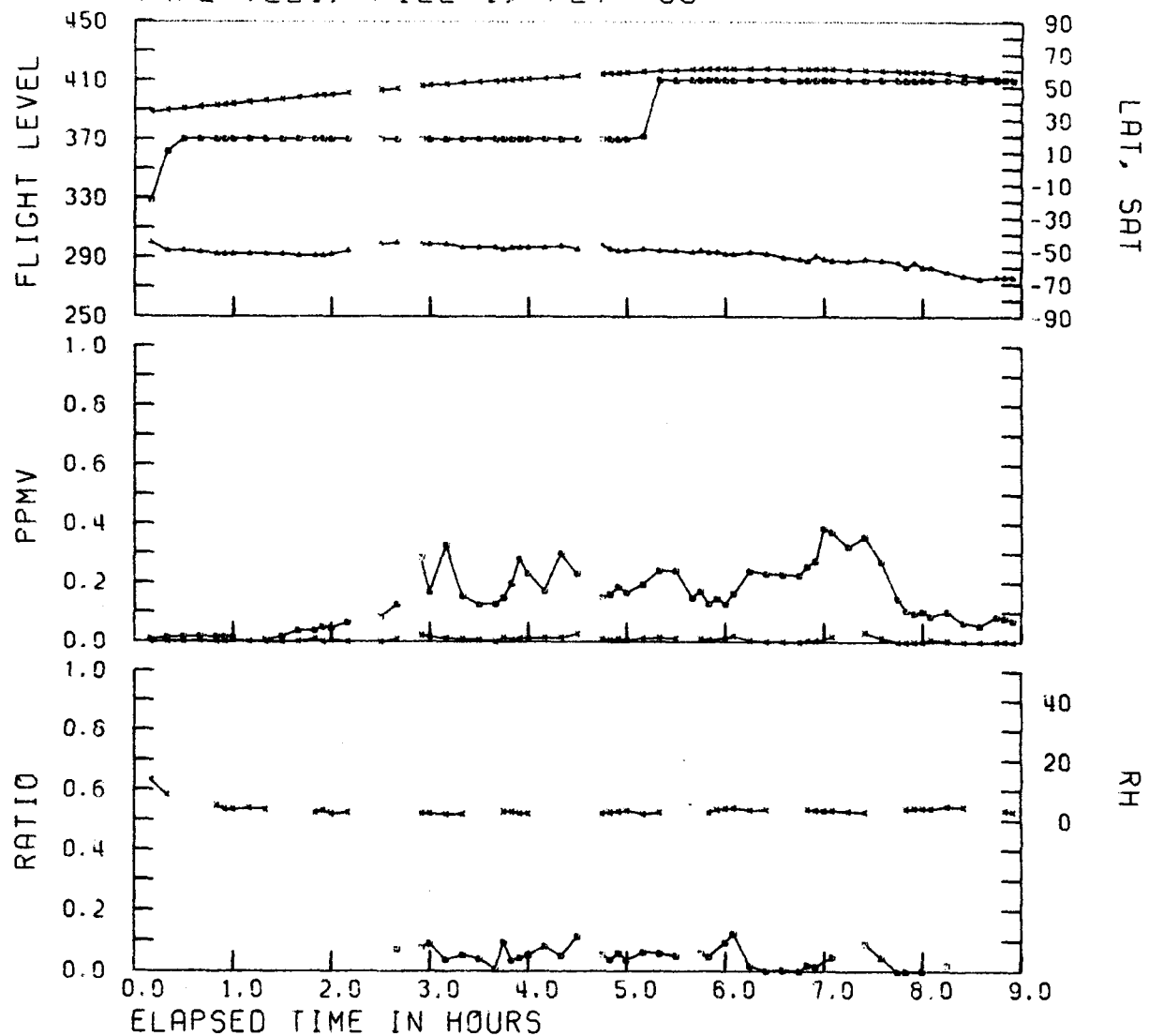
SFO TO LAX DEPARTURE 26 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 49



ELAPSED TIME IN HOURS

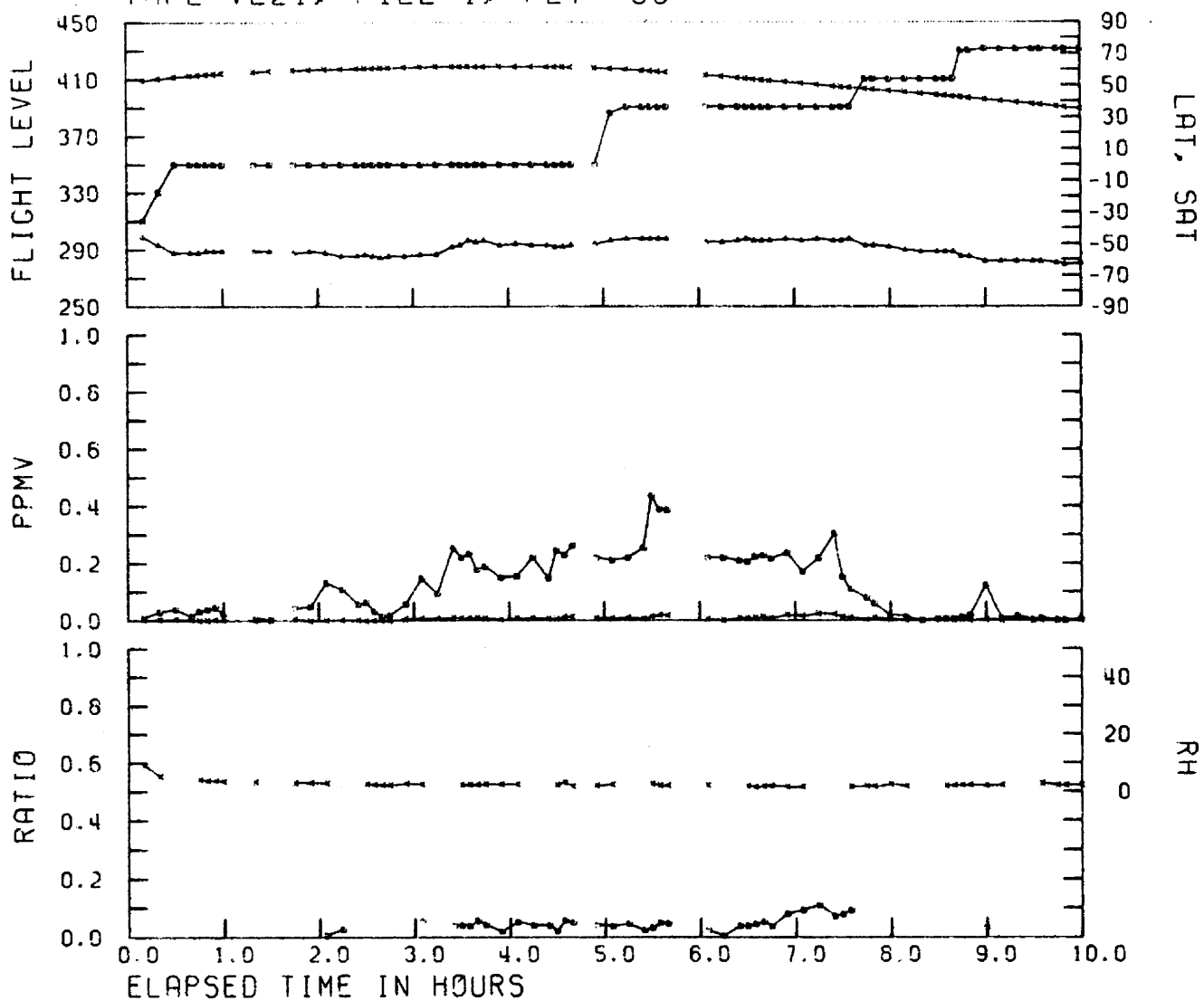
B-43

LAX TO LHR DEPARTURE 26 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 50

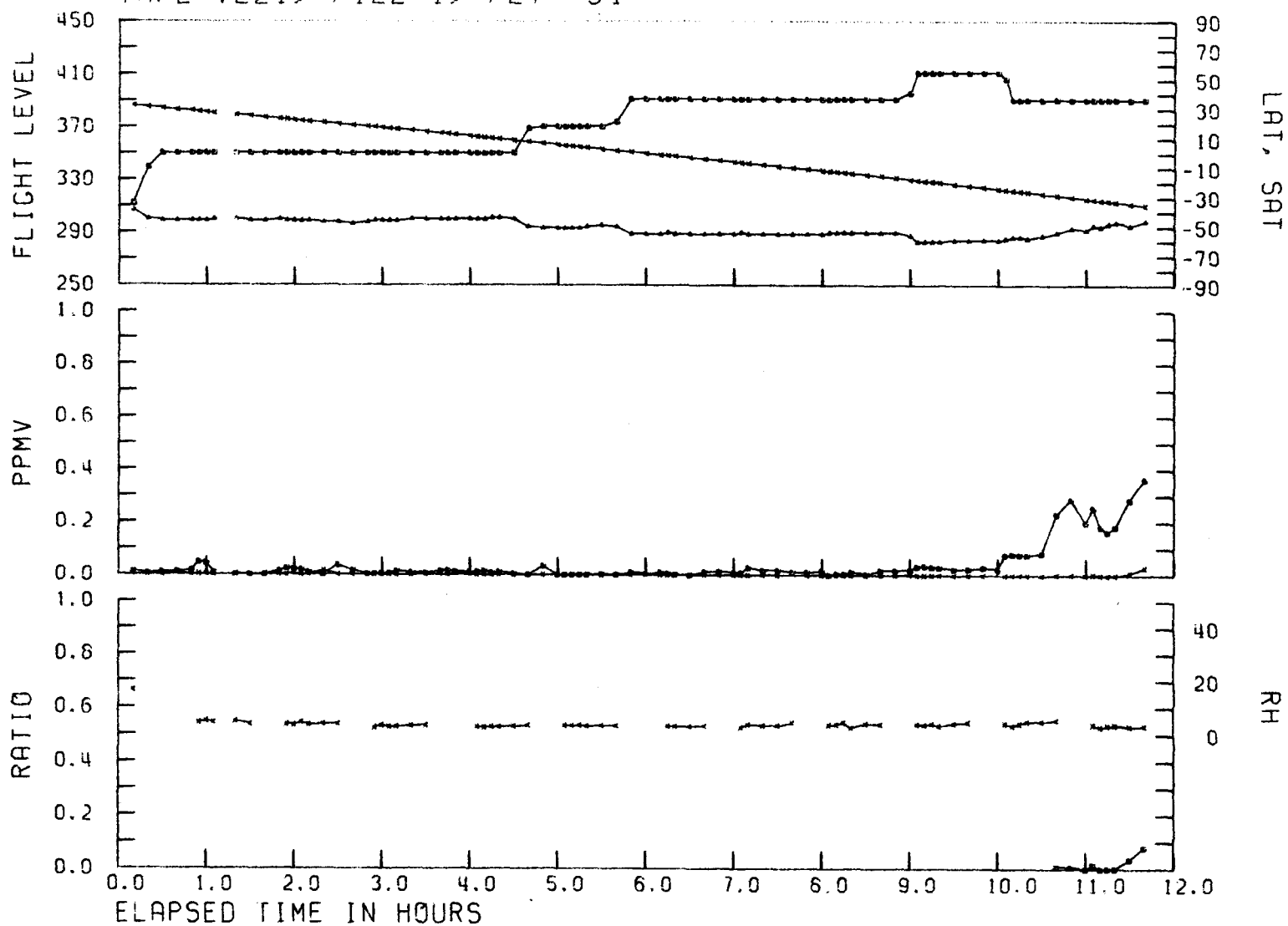


B-44

LHR TO LAX DEPARTURE 27 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 53

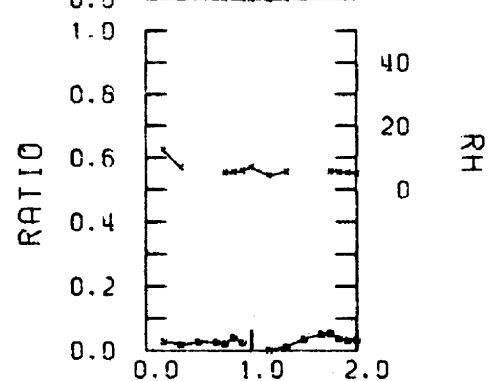
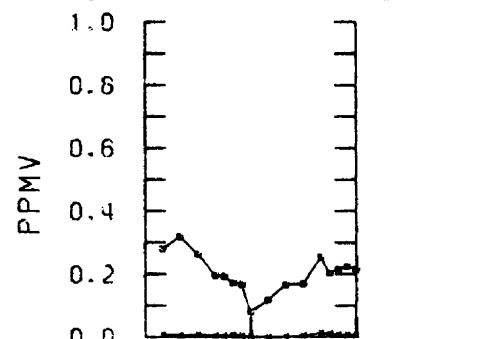
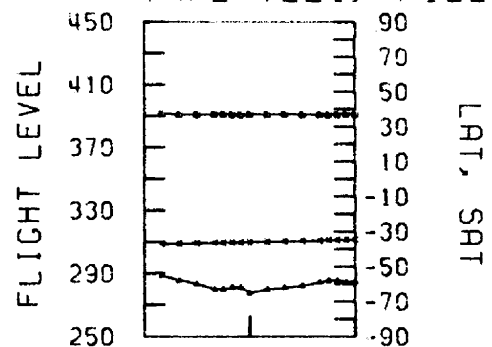


LAX TO AKL DEPARTURE 28 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 54



B-46

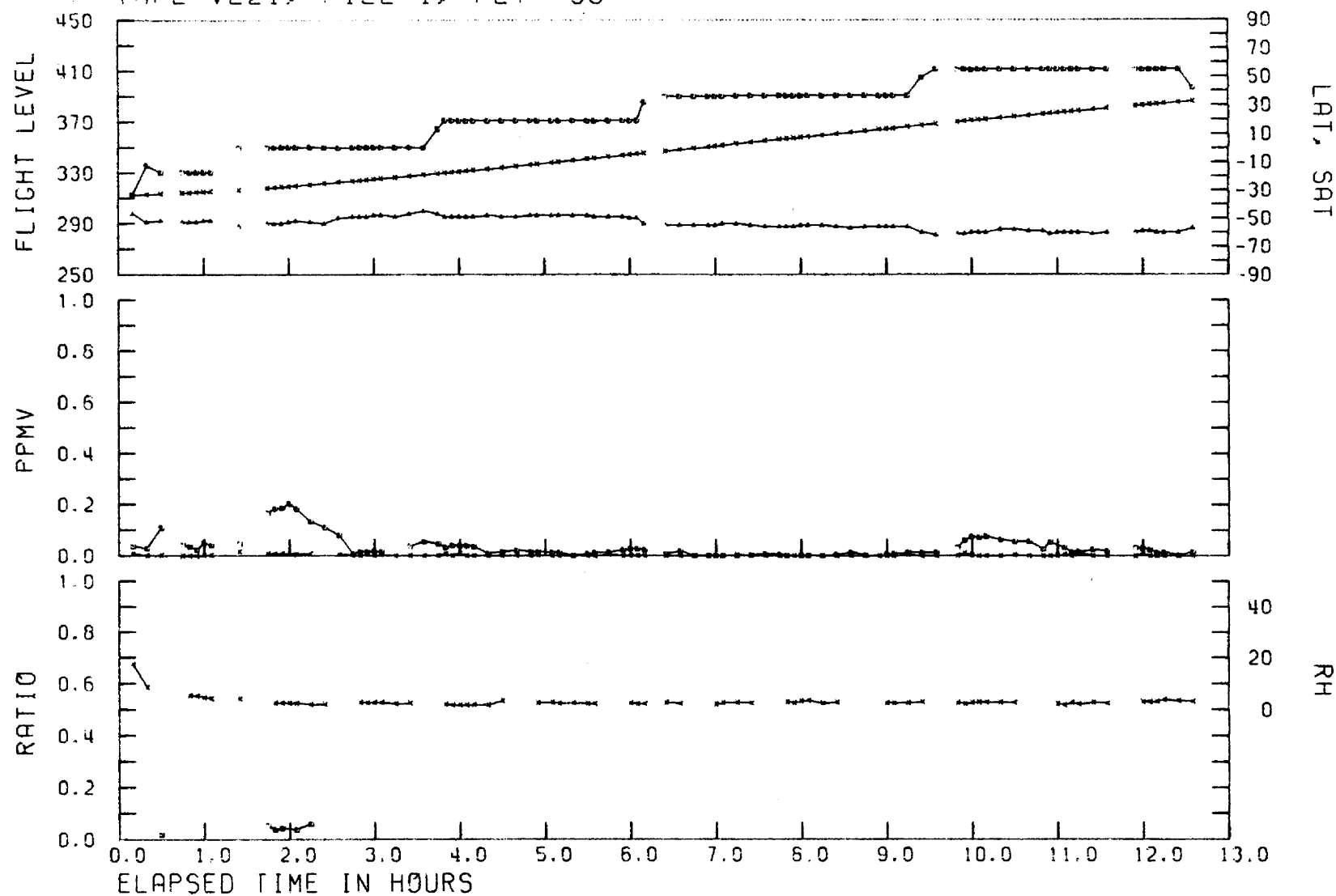
AKL TO SYD DEPARTURE 28 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 55



ELAPSED TIME IN HOURS

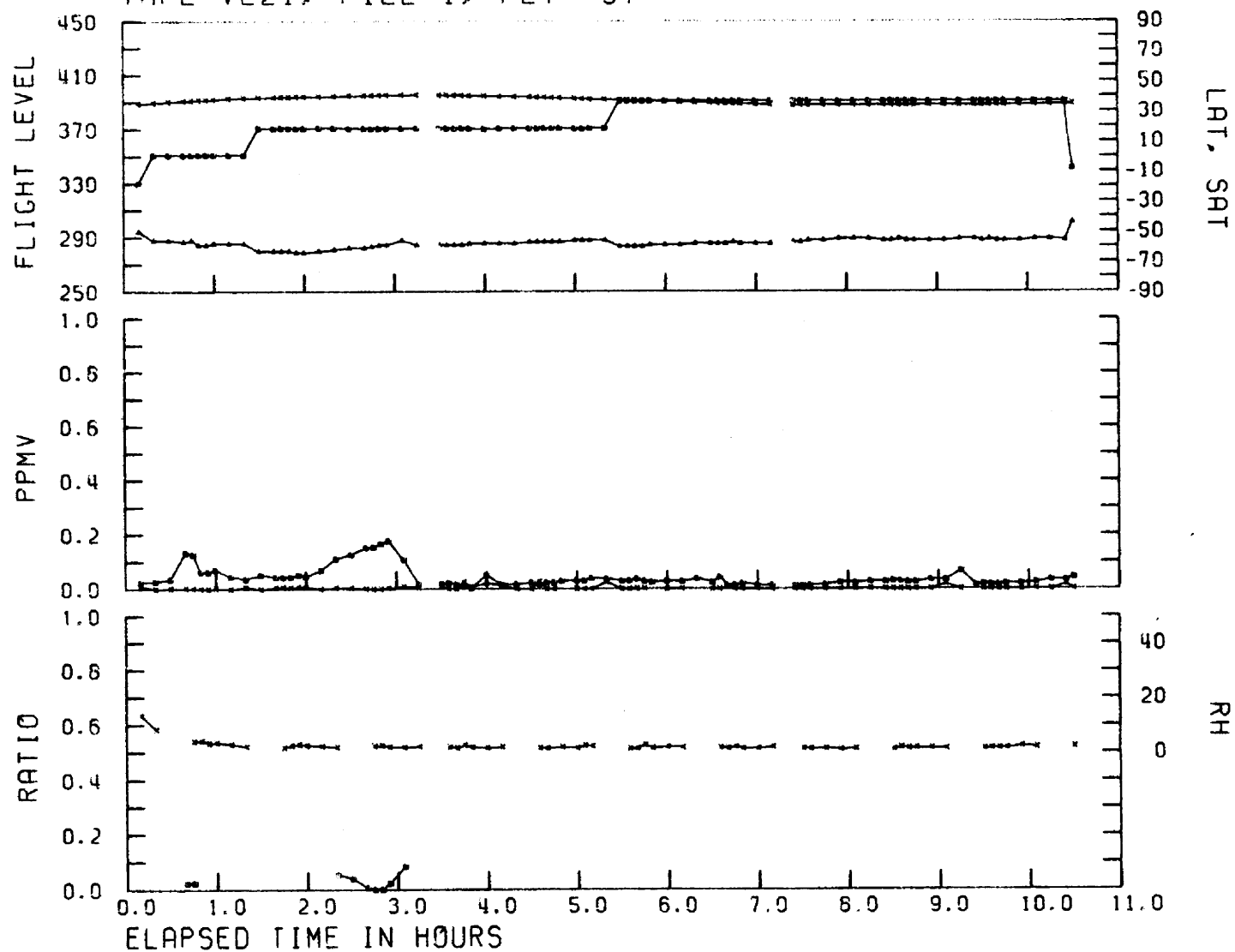
B-47

SYD TO LAX DEPARTURE 29 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 56



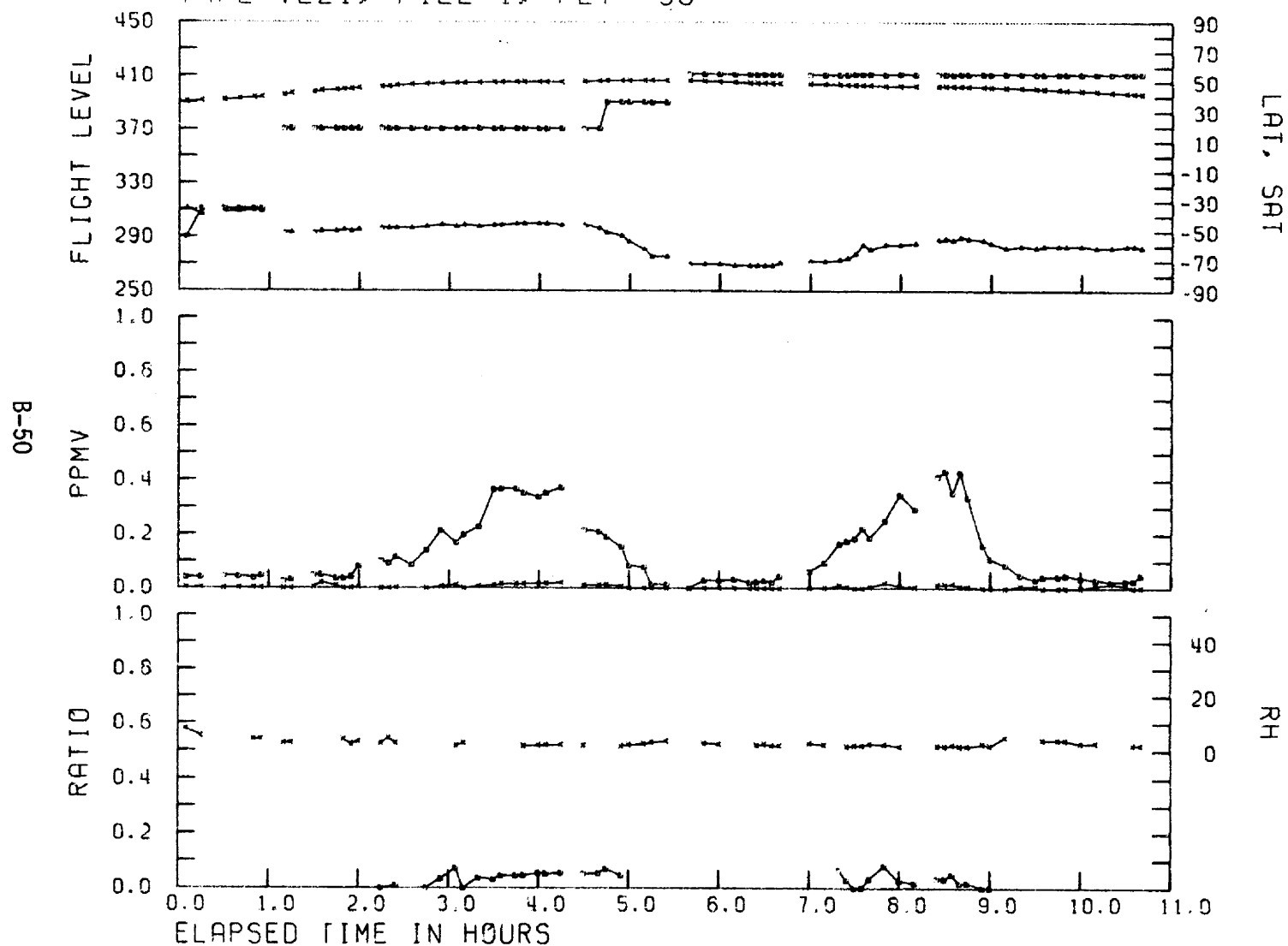
B-48

LAX TO NRT DEPARTURE 30 OCT 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 57

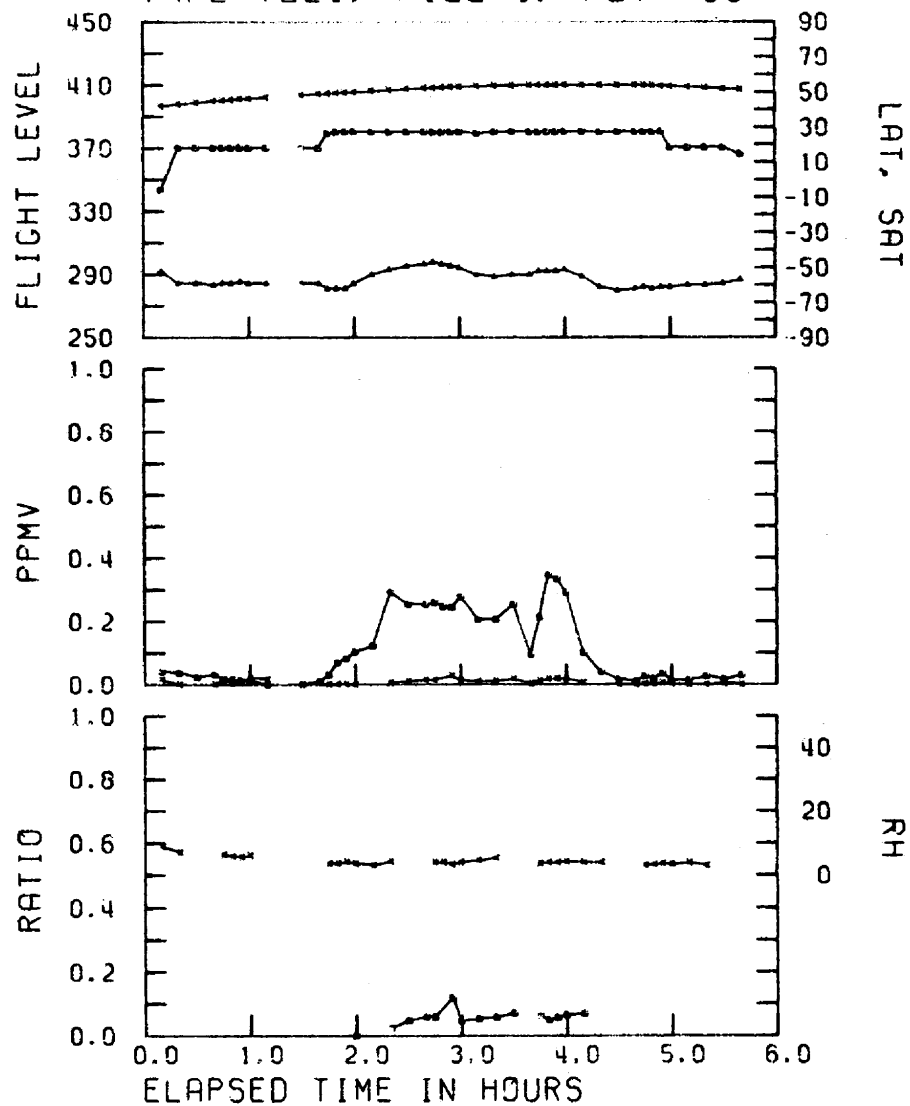


B-49

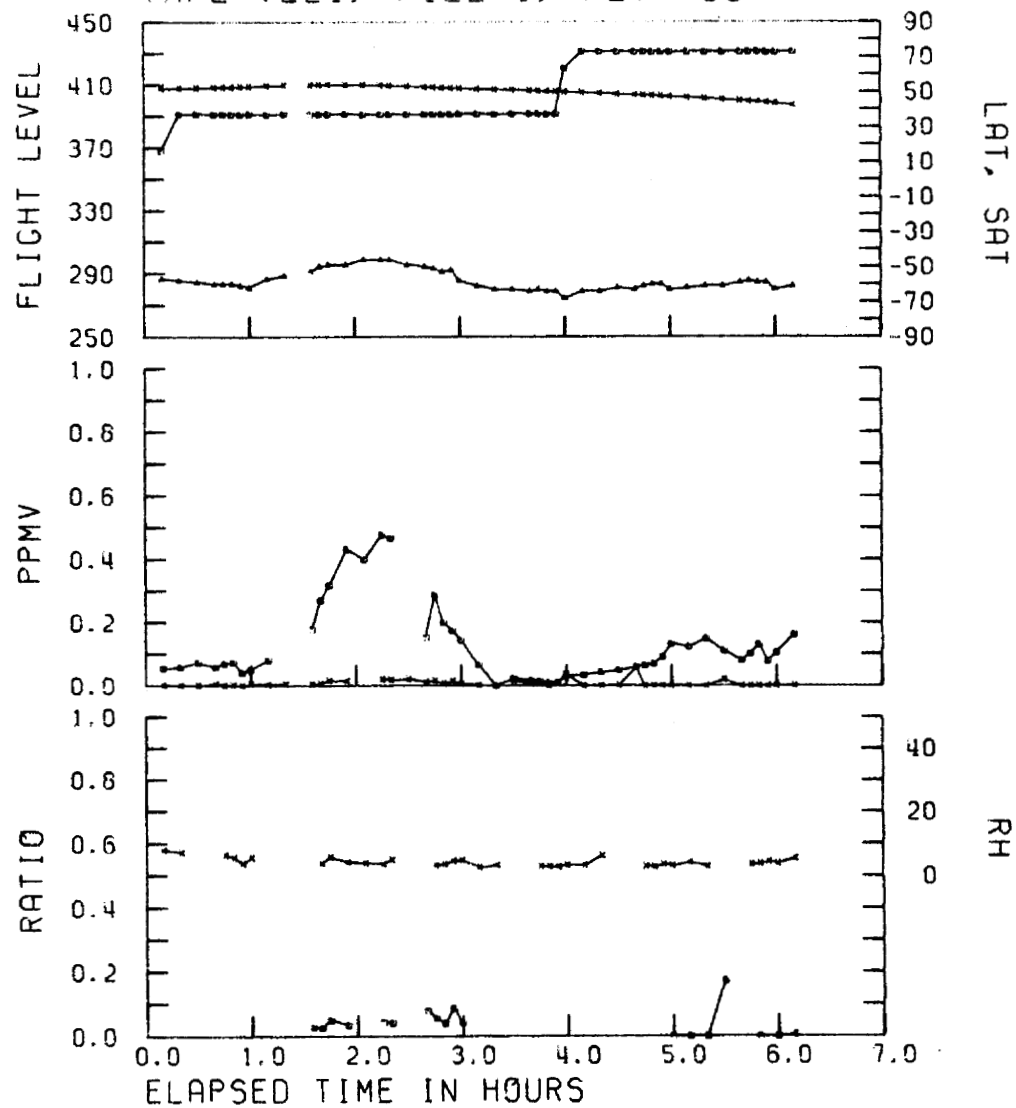
NRT TO JFK DEPARTURE 30 OCT 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 58



JFK TO LHR DEPARTURE 5 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 59

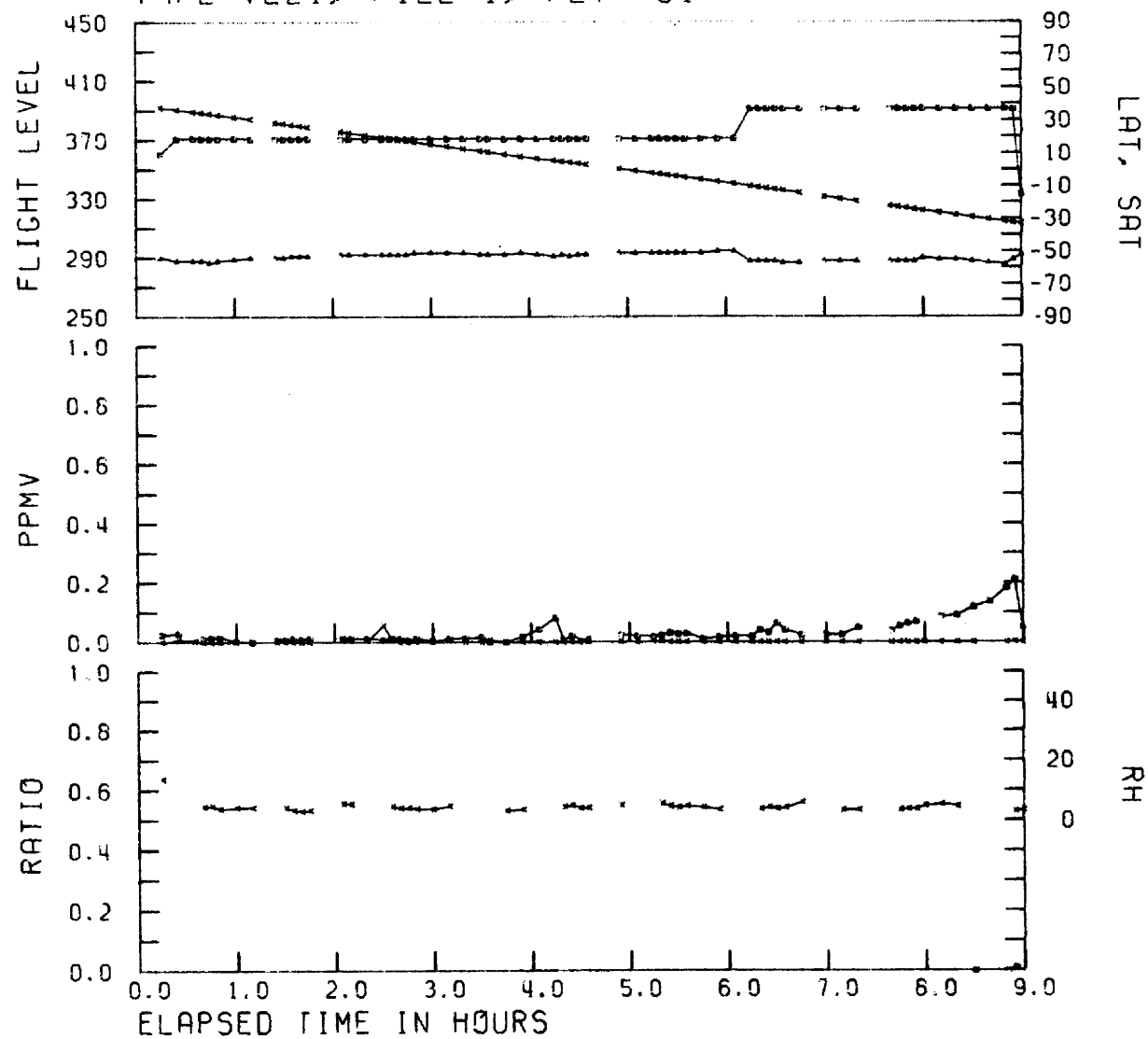


LHR TO JFK DEPARTURE 6 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 60



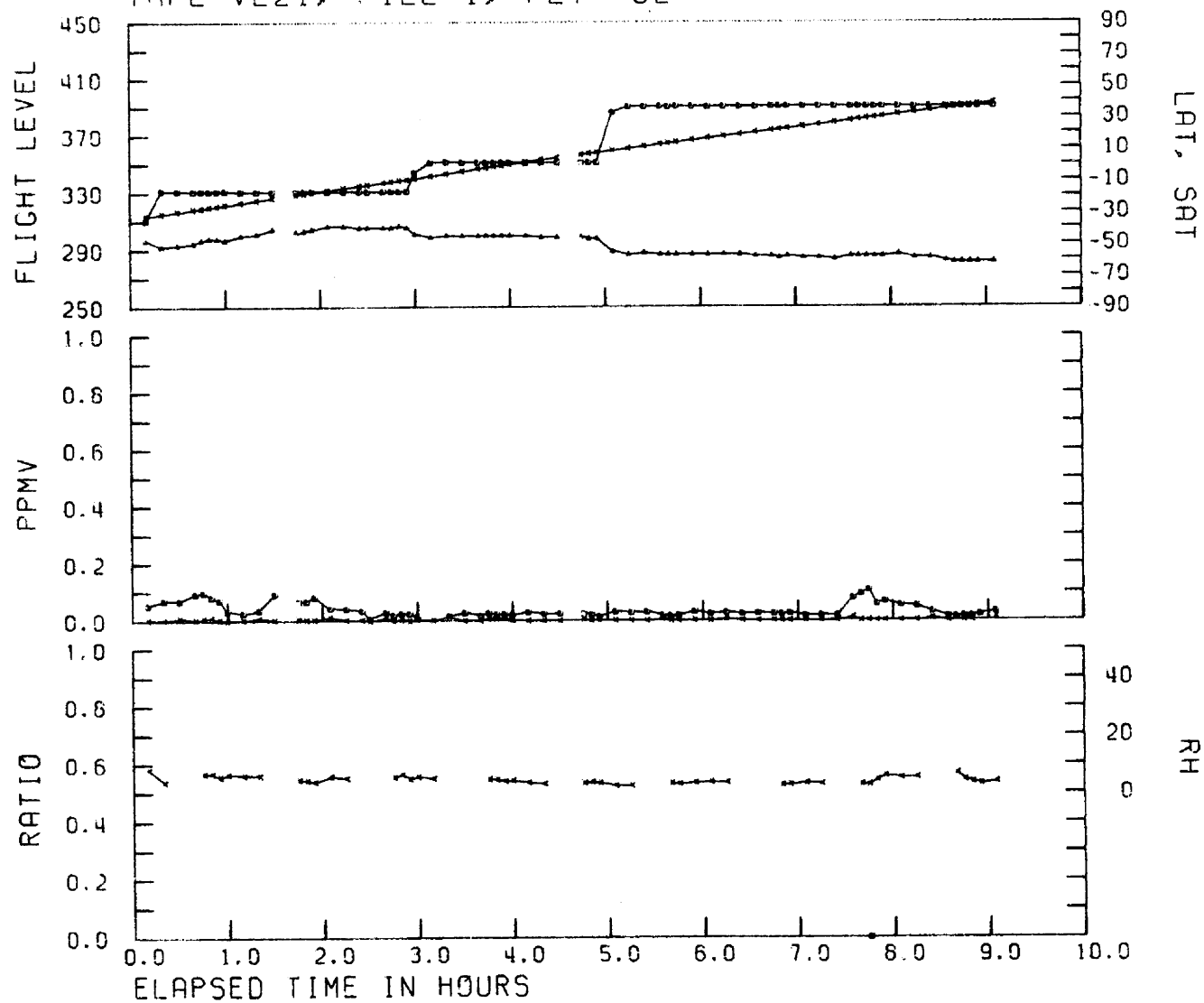
B-52

JFK TO EZE DEPARTURE 11 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 61



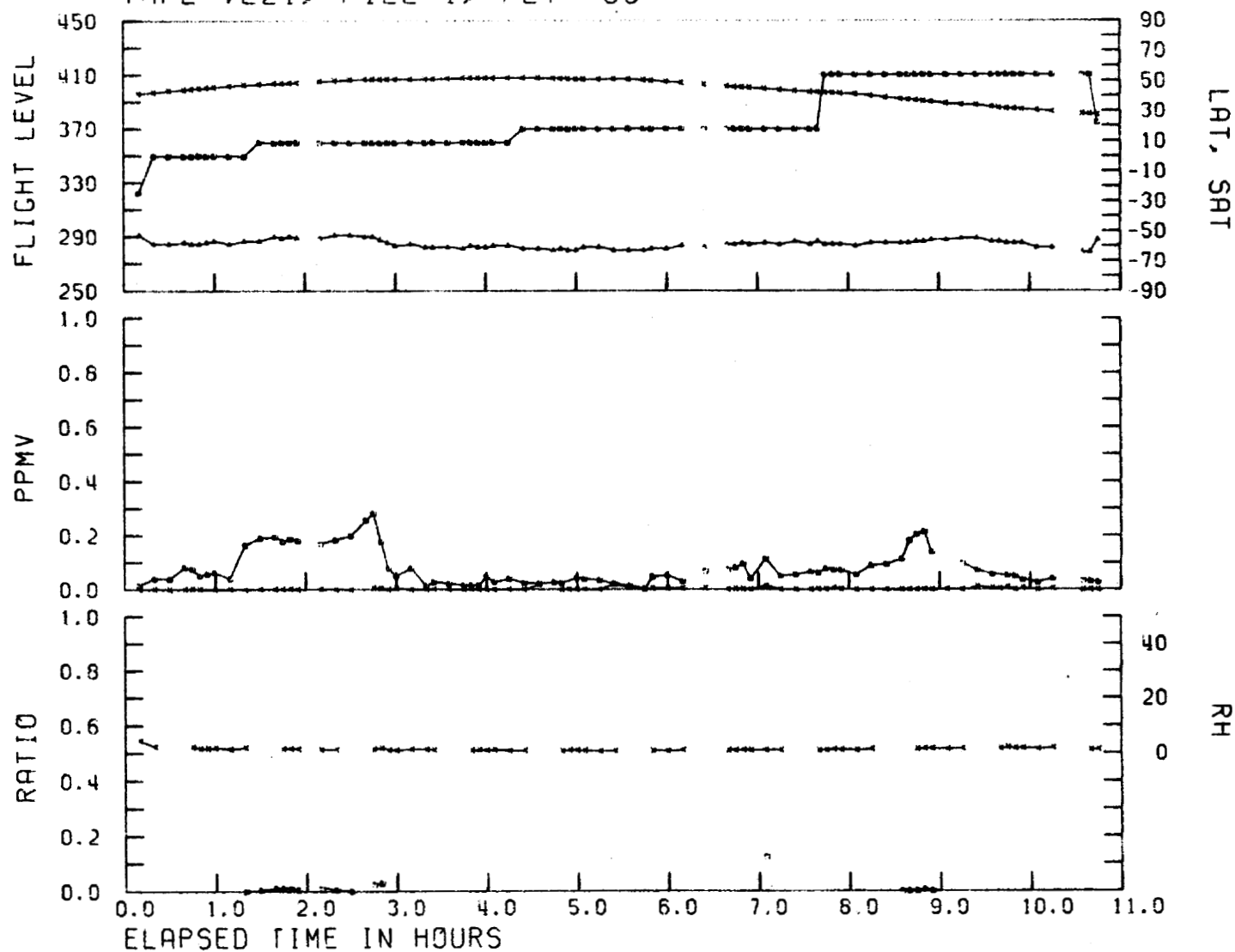
B-53

EZE TO JFK DEPARTURE 12 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 62



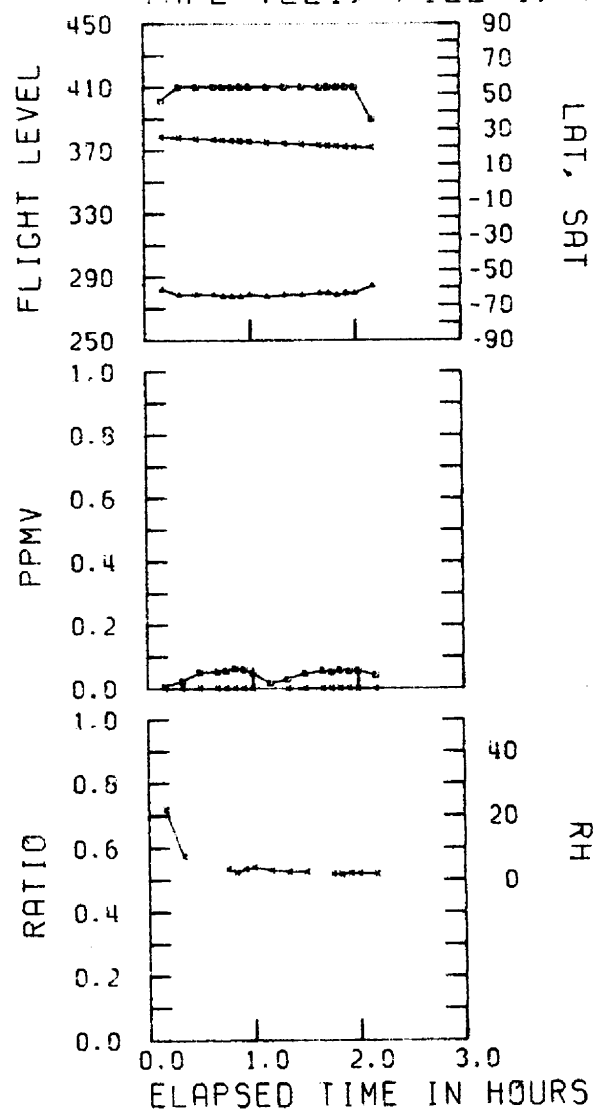
B-54

JFK TO BAH DEPARTURE 22 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 63

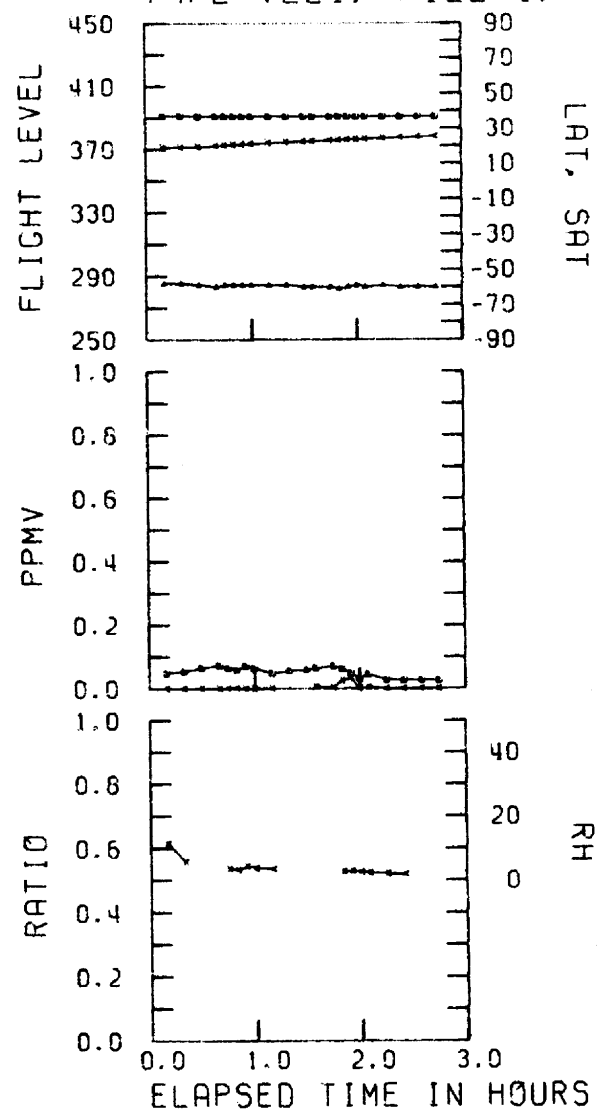


B-55

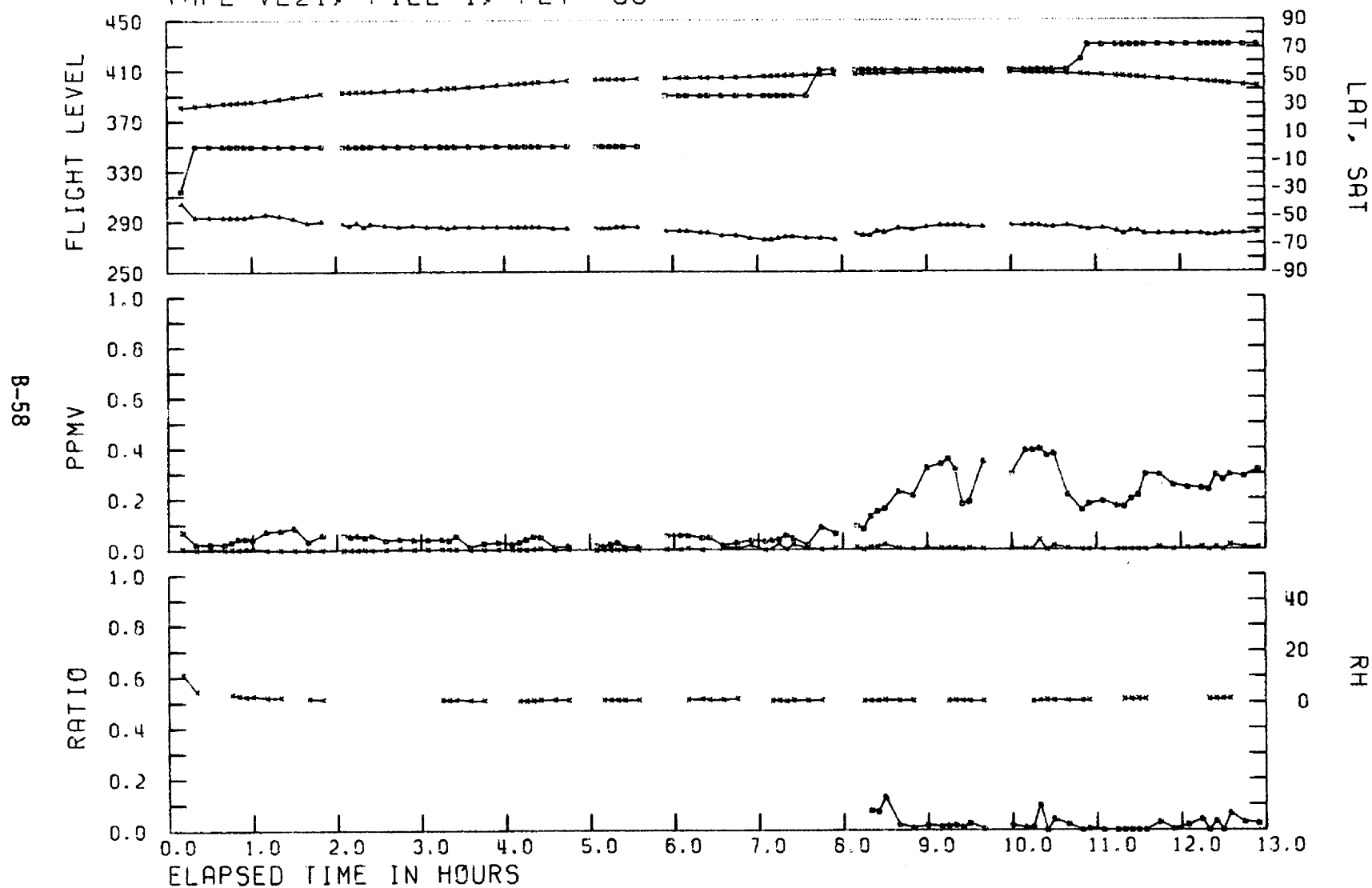
BAH TO BOM DEPARTURE 23 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 64



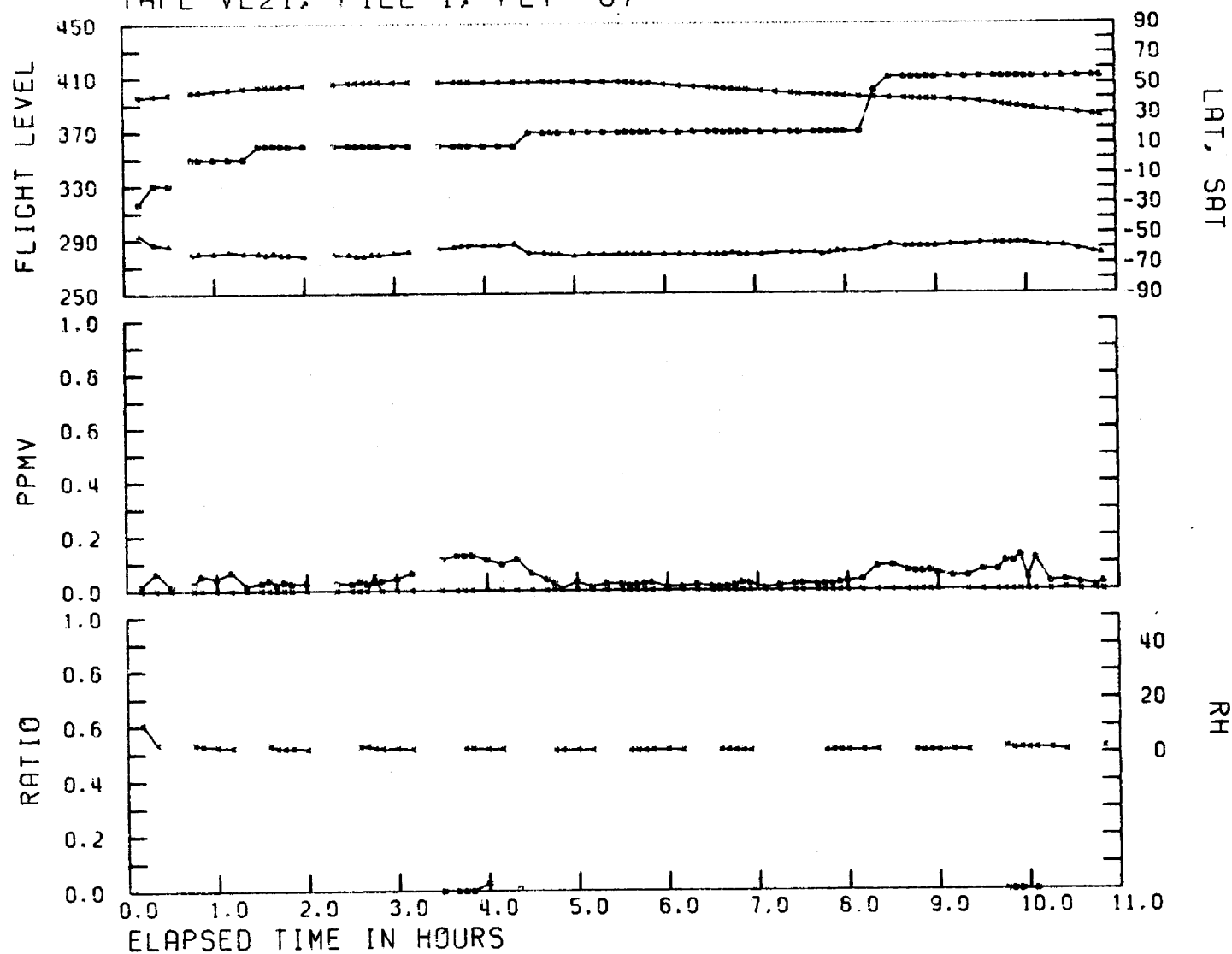
BOM TO BAH DEPARTURE 23 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 65



BAH TO JFK DEPARTURE 23 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 66

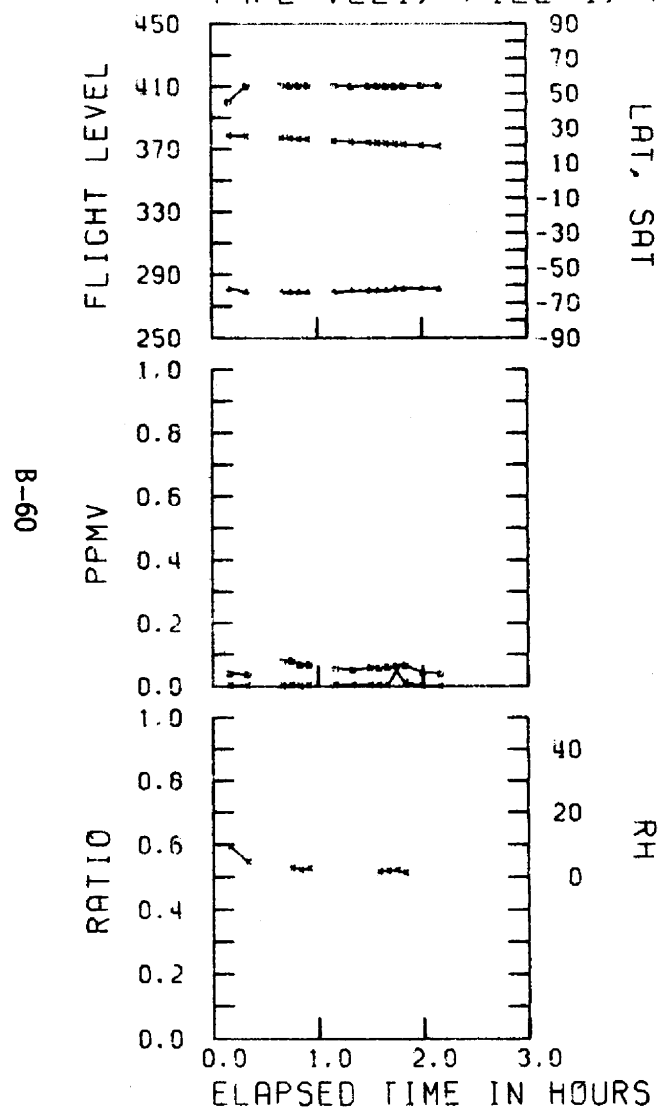


JFK TO BAH DEPARTURE 25 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 67



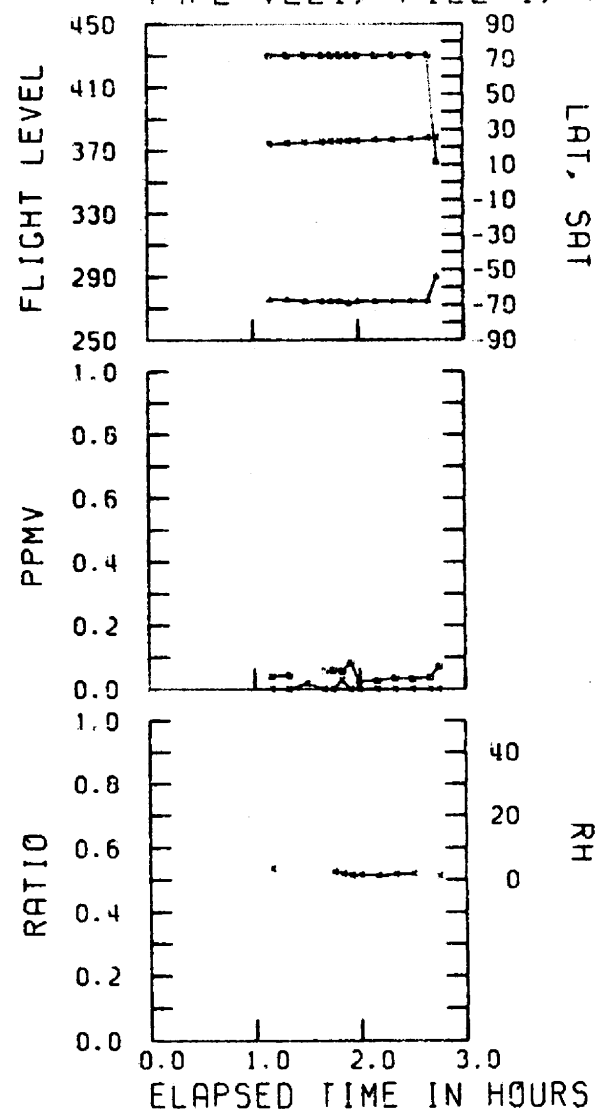
B-59

BAH TO BOM DEPARTURE 25 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 68

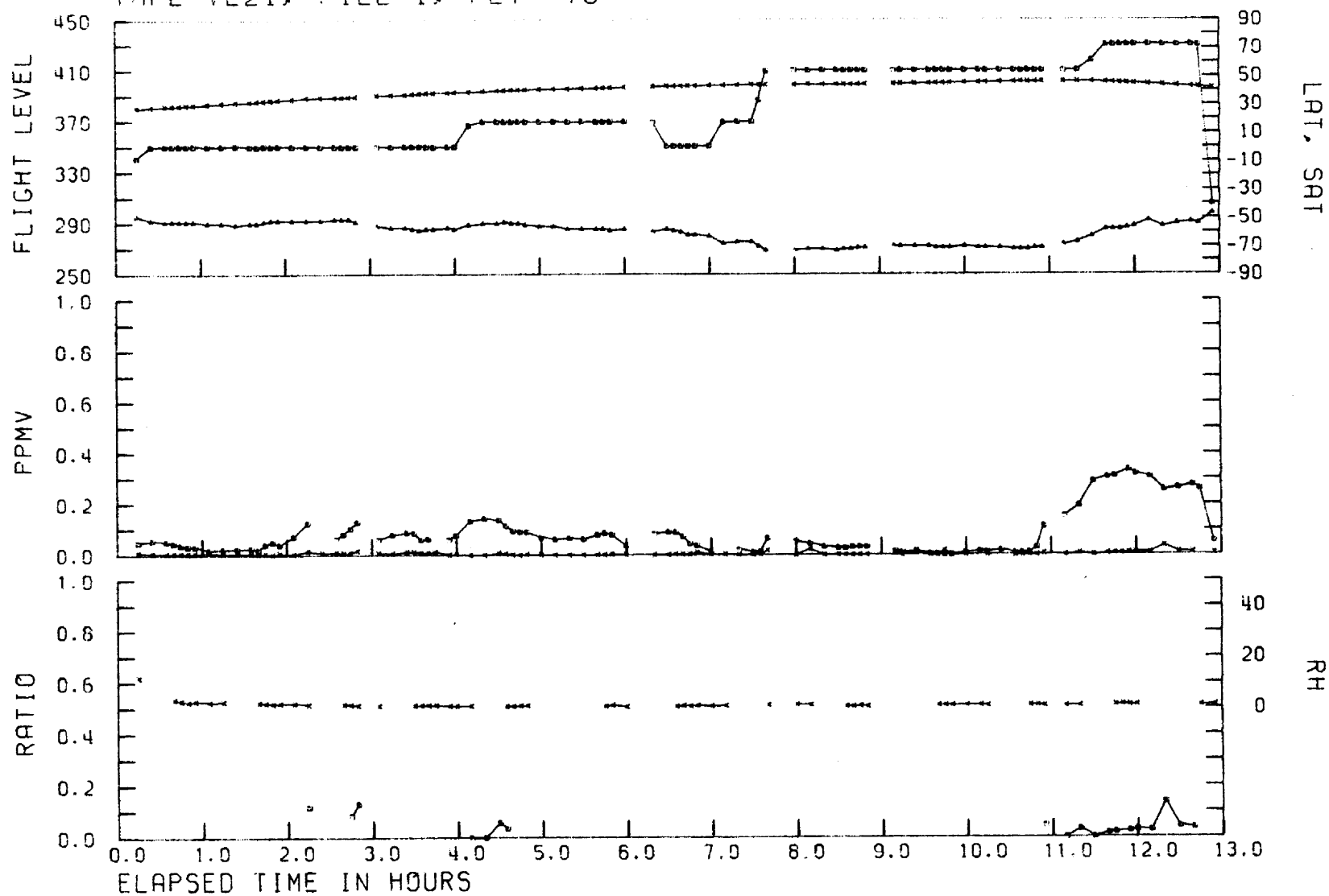


BOM TO BAH DEPARTURE 25 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 69

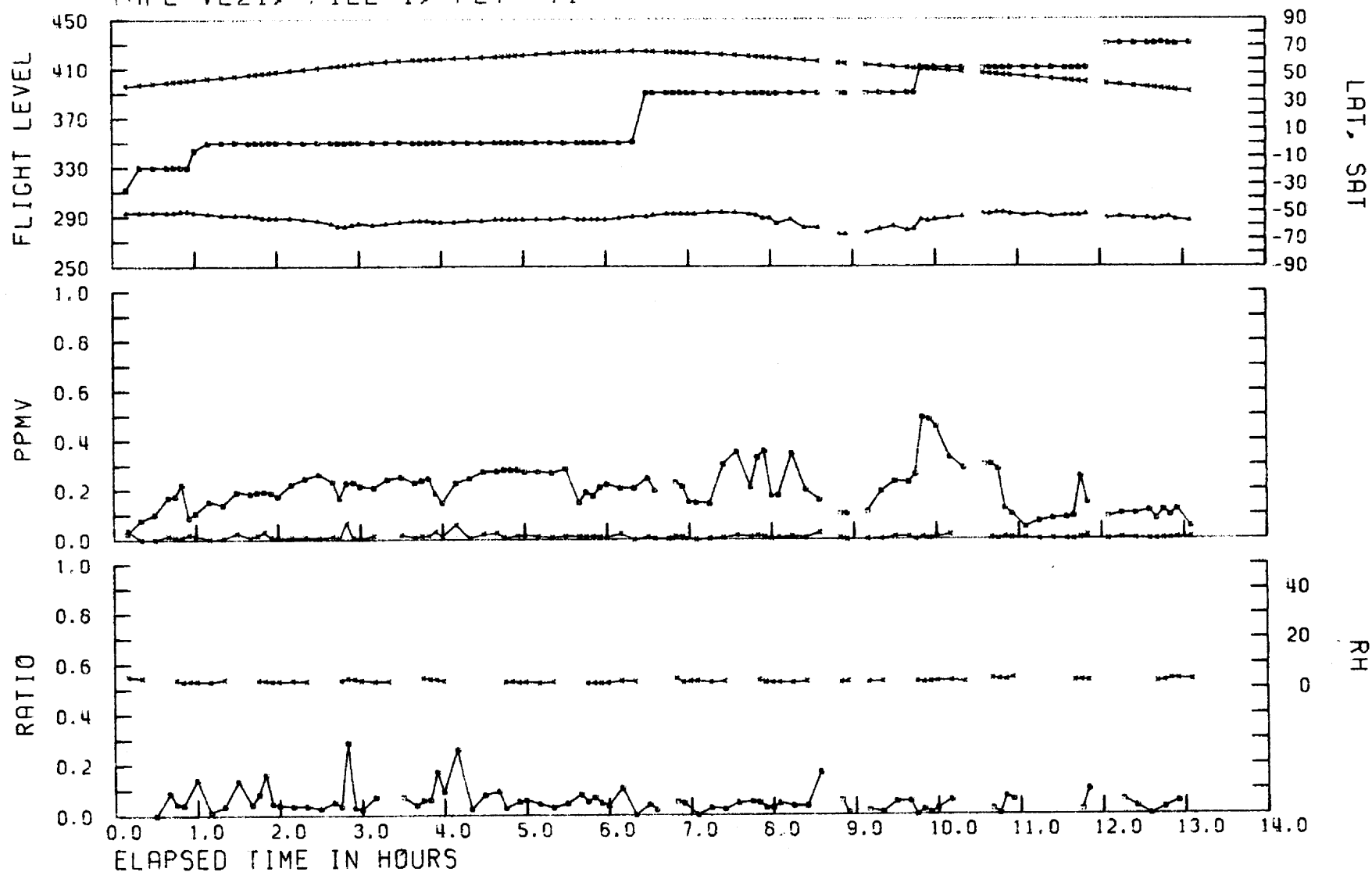
8-61



BAH TO JFK DEPARTURE 25 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 70

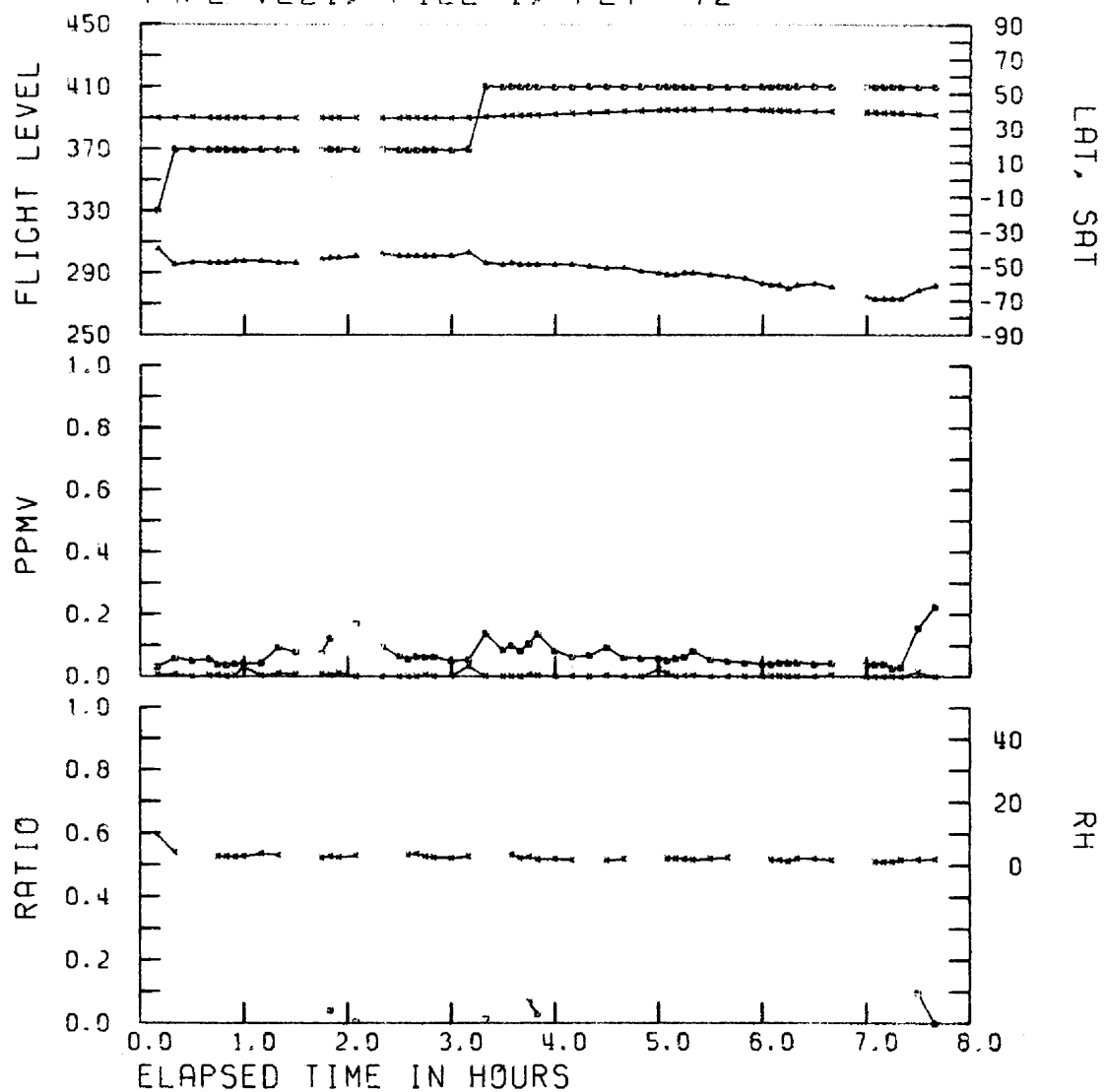


JFK TO NRT DEPARTURE 26 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 71



B-63

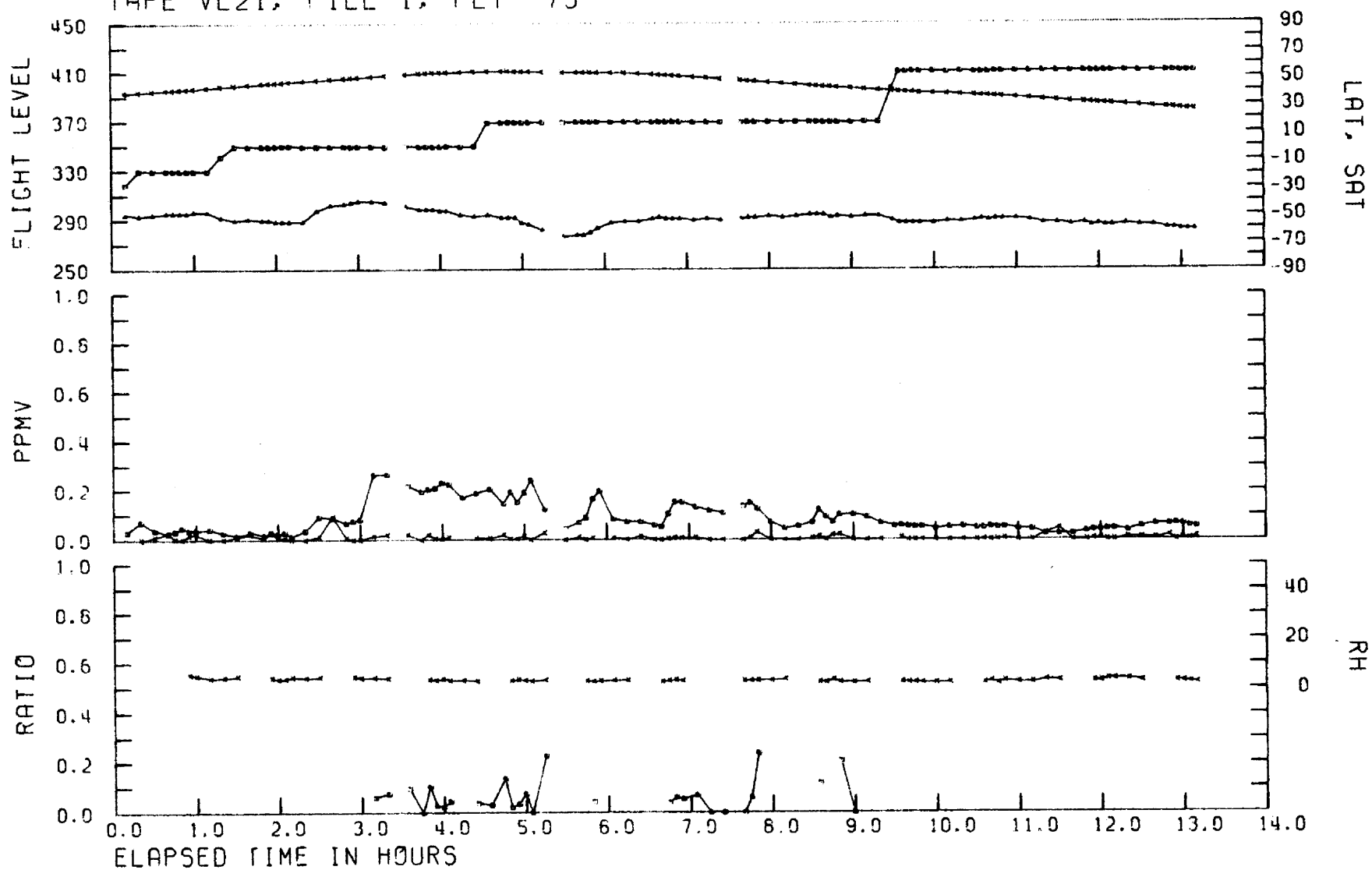
NRT TO SFO DEPARTURE 27 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 72



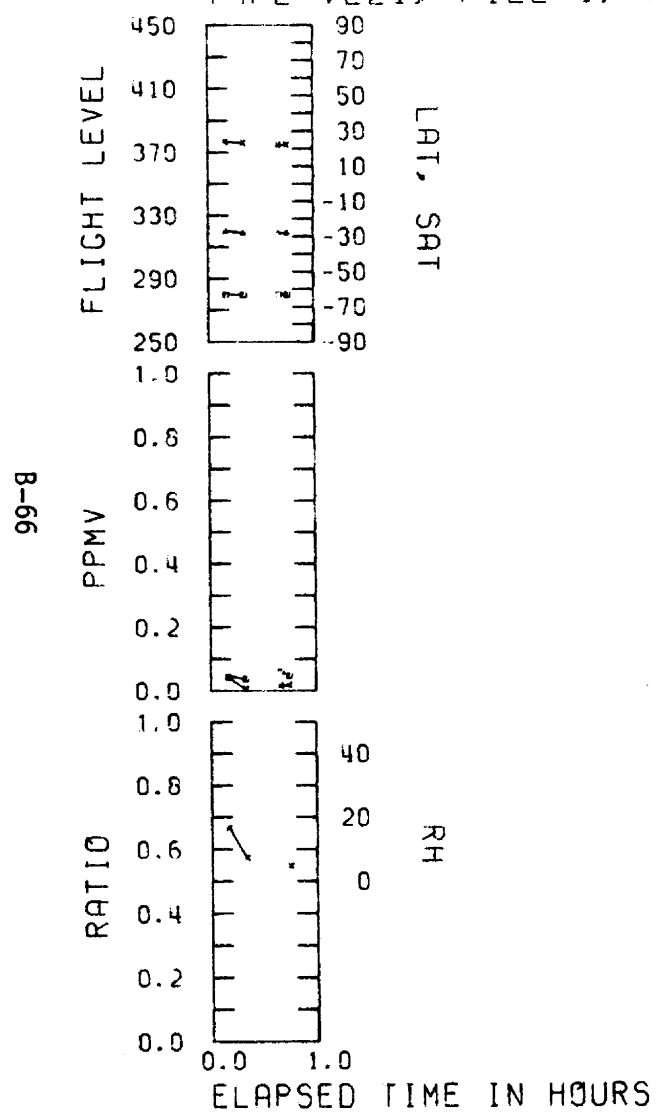
B-64

SFO TO TPE DEPARTURE 27 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 73

B-65

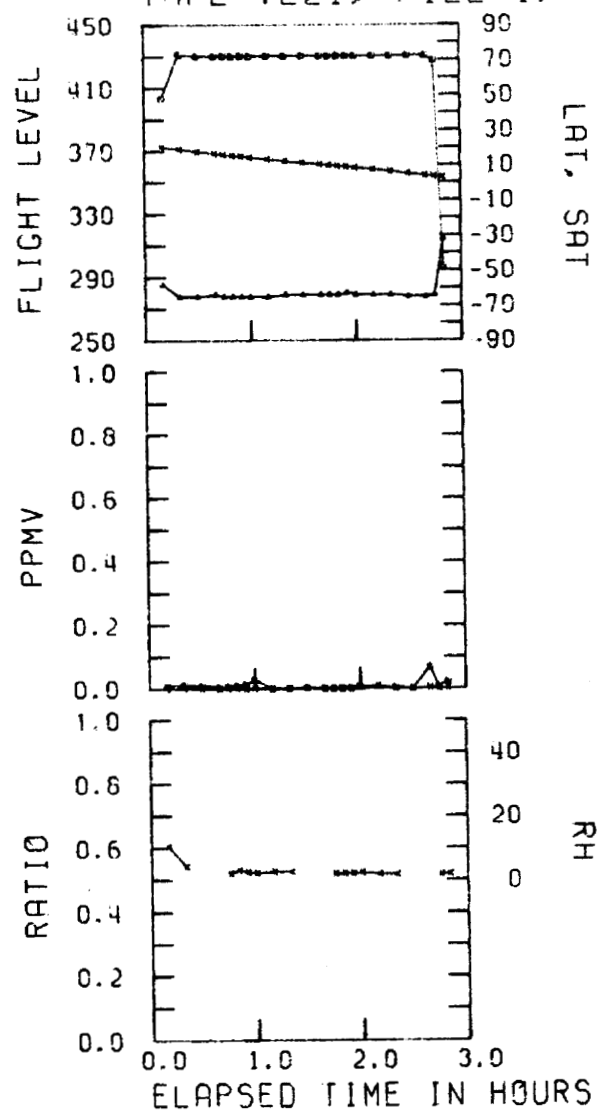


TPE TO HKG DEPARTURE 28 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 74

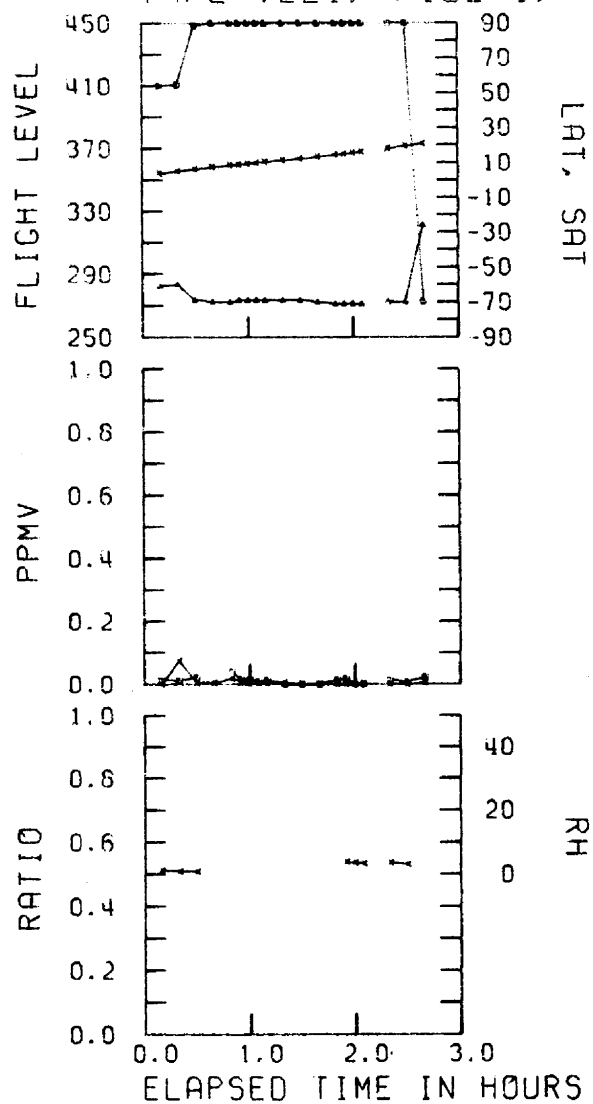


HKG TO SIN DEPARTURE 28 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 75

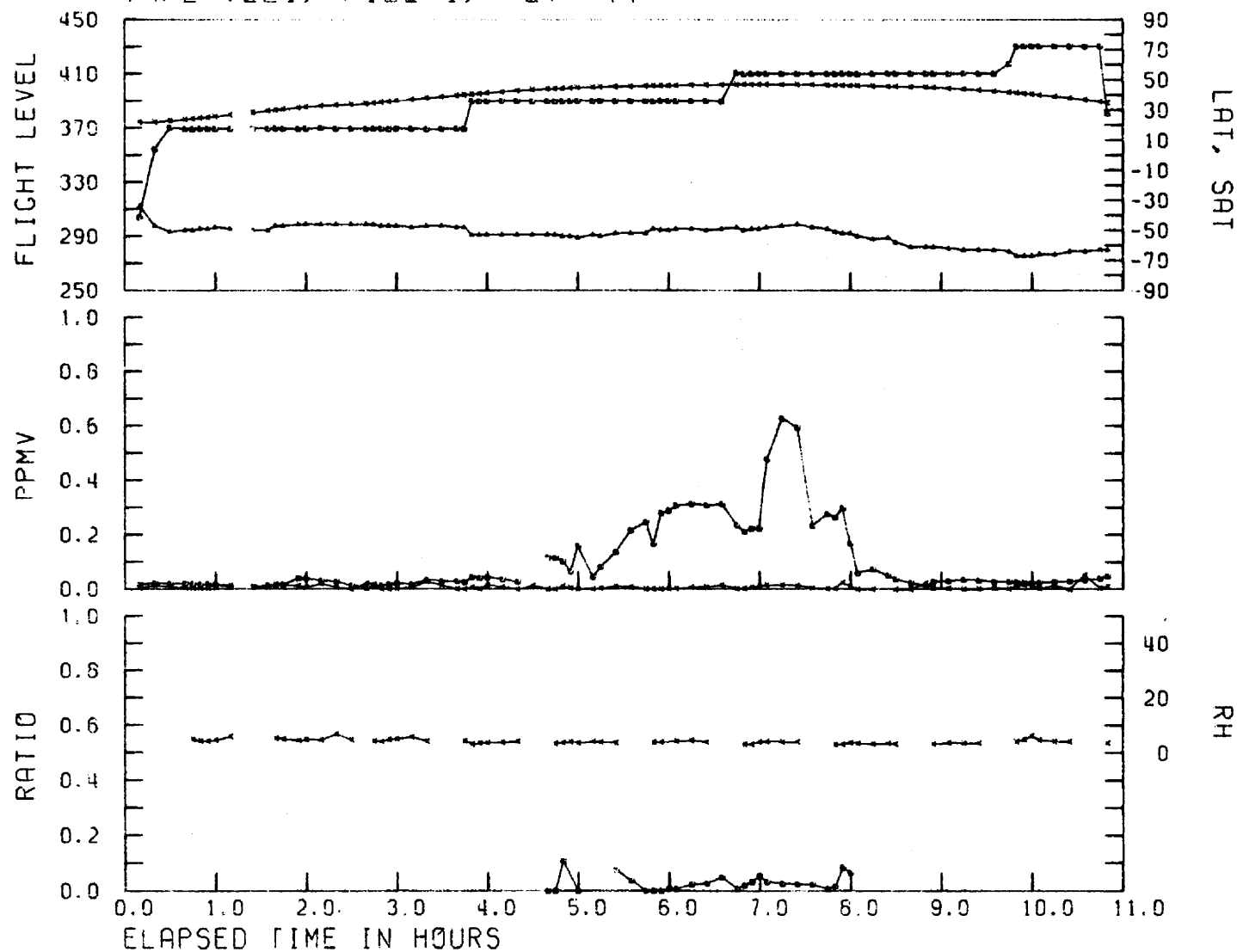
B-67



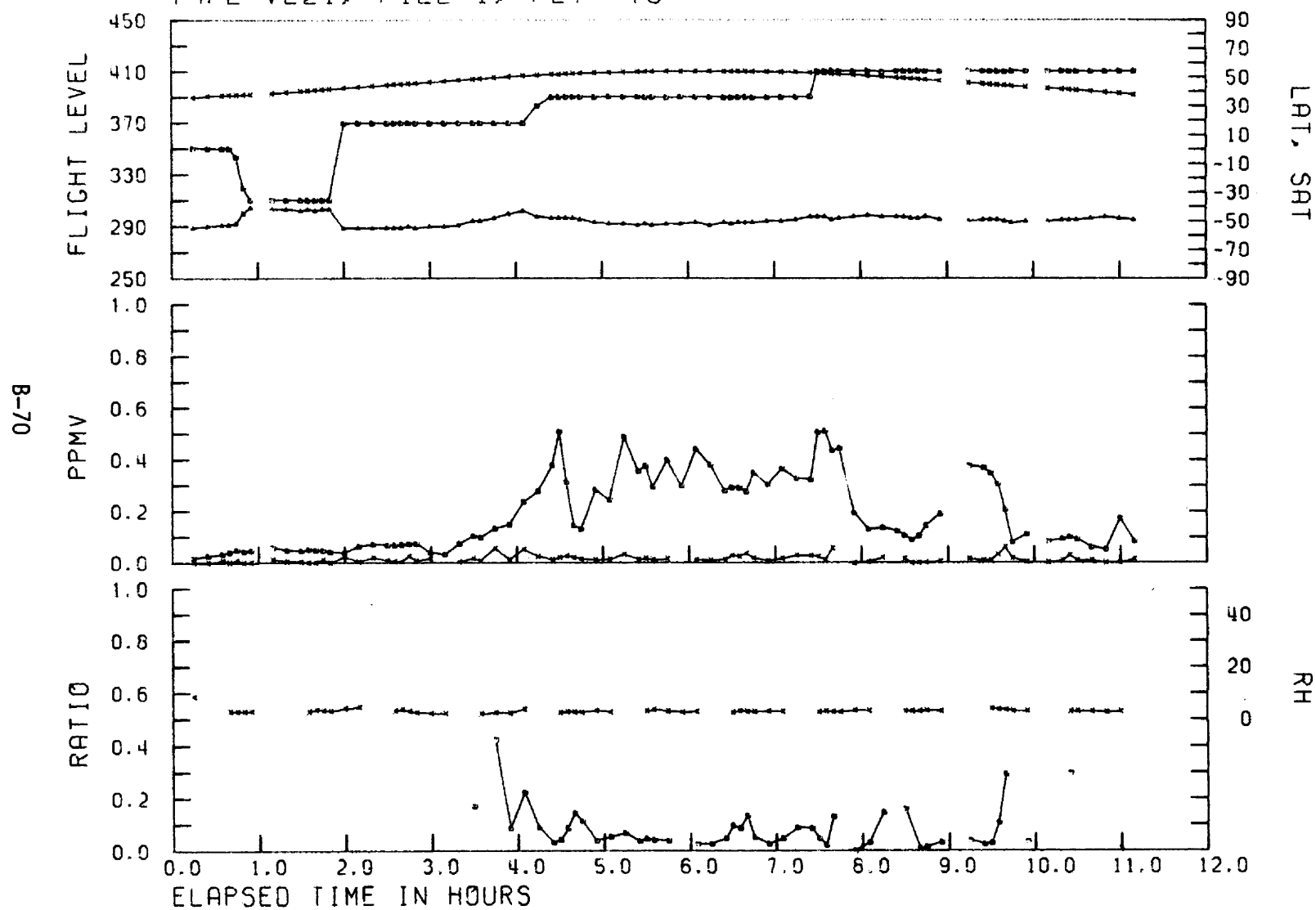
SIN TO HKG DEPARTURE 29 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 76



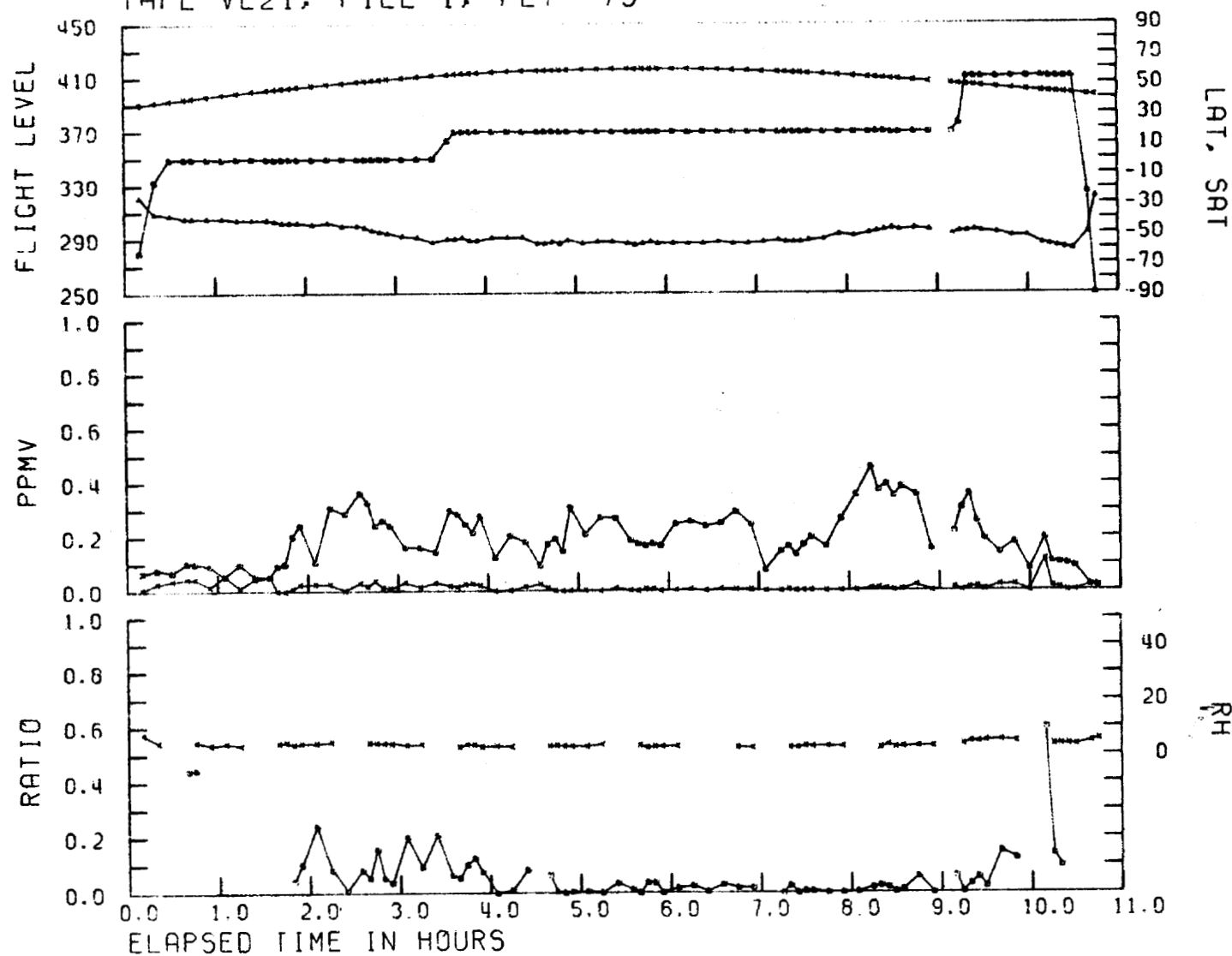
HKG TO LAX DEPARTURE 29 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 77



LAX TO NRT DEPARTURE 29 NOV 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 78

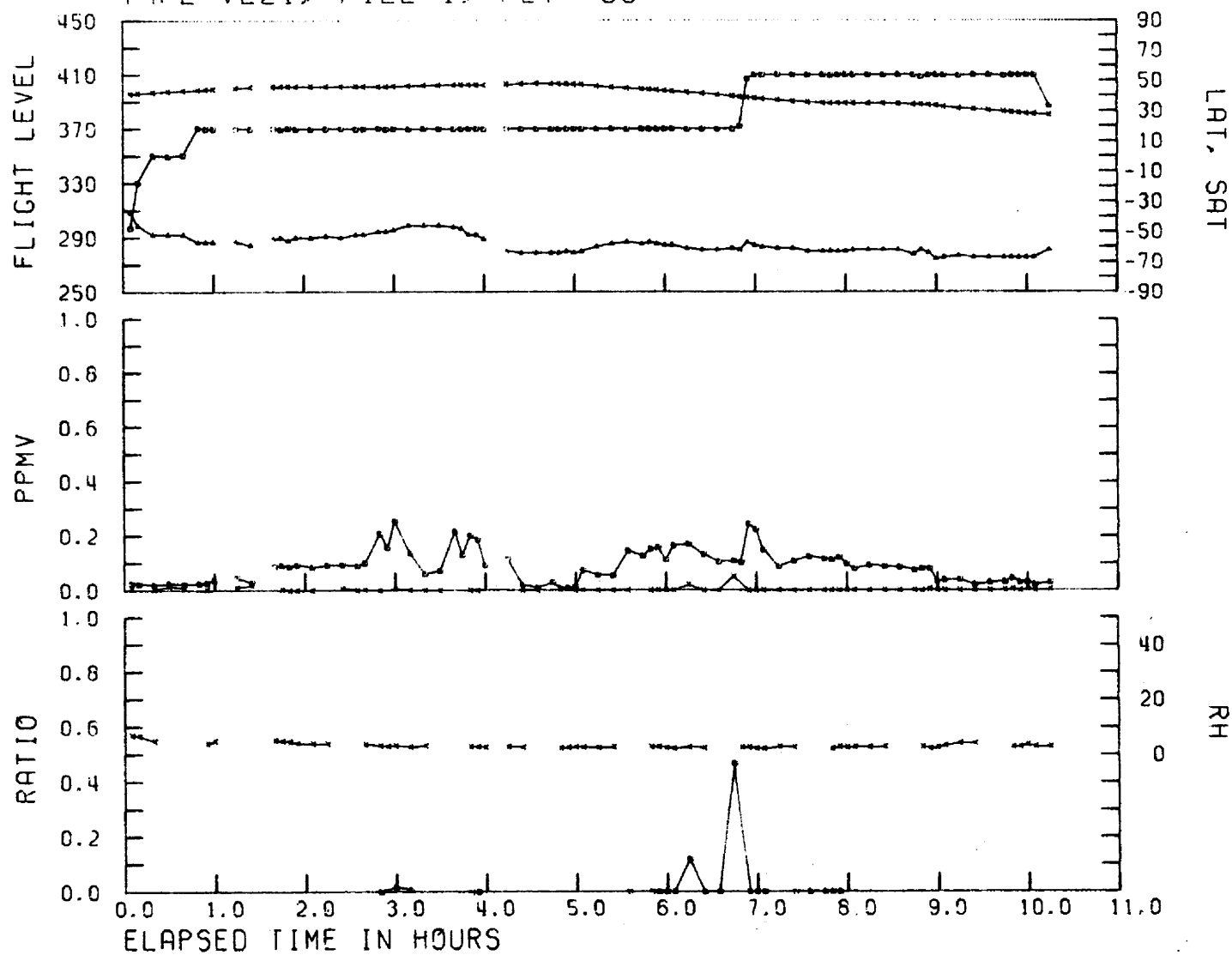


NRT TO JFK DEPARTURE 30 NOV 78 PANAM -N533PA.
 TAPE VL21, FILE 1, FLT 79



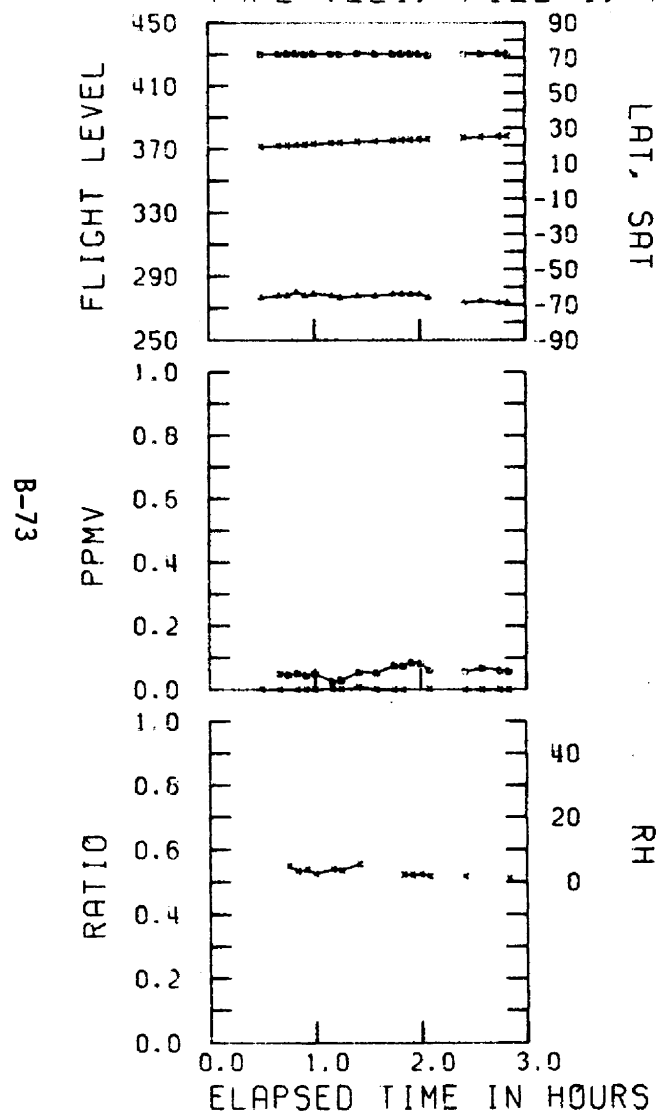
B-71

JFK TO BAH DEPARTURE 30 NOV 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 80

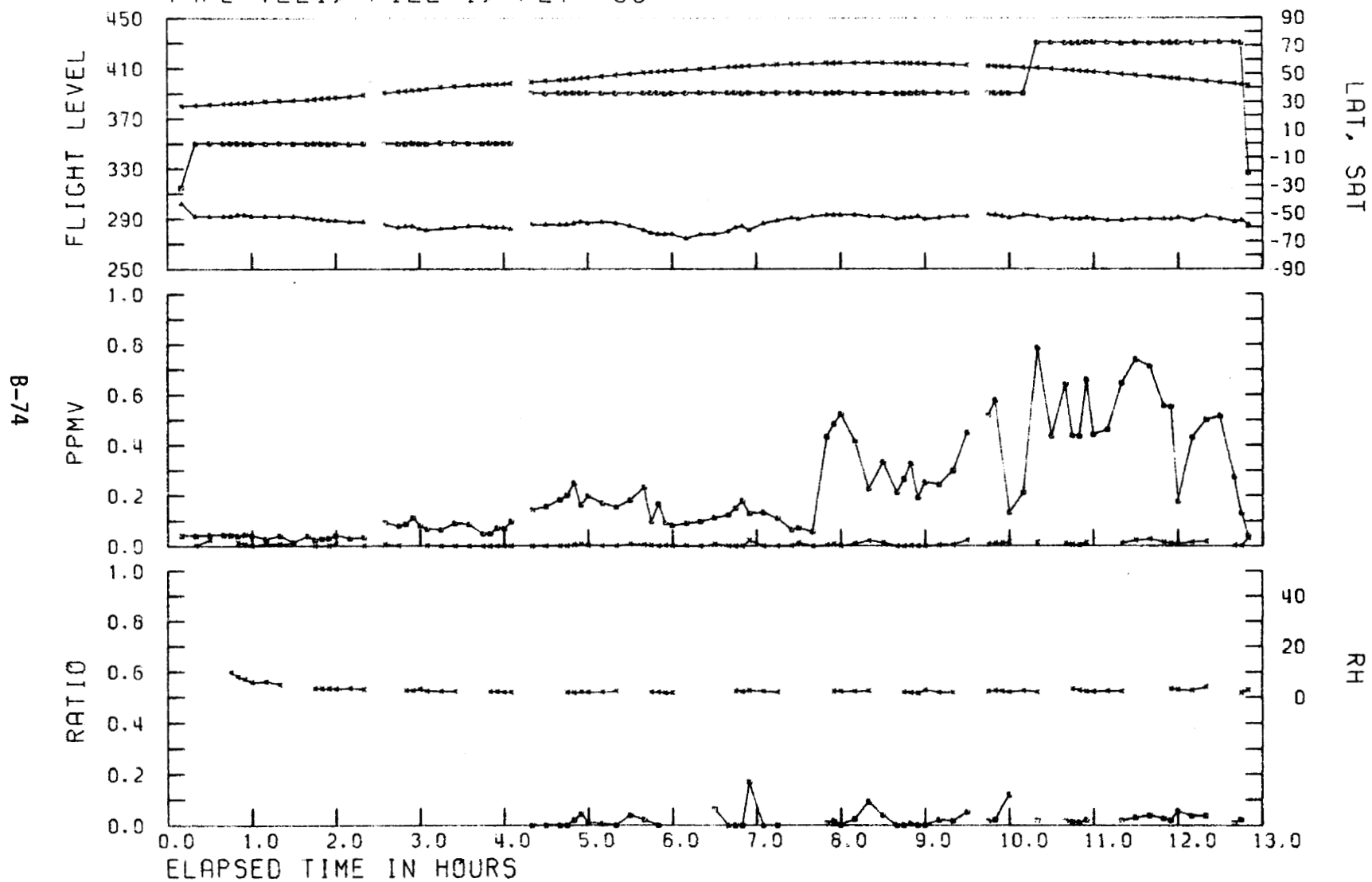


B-72

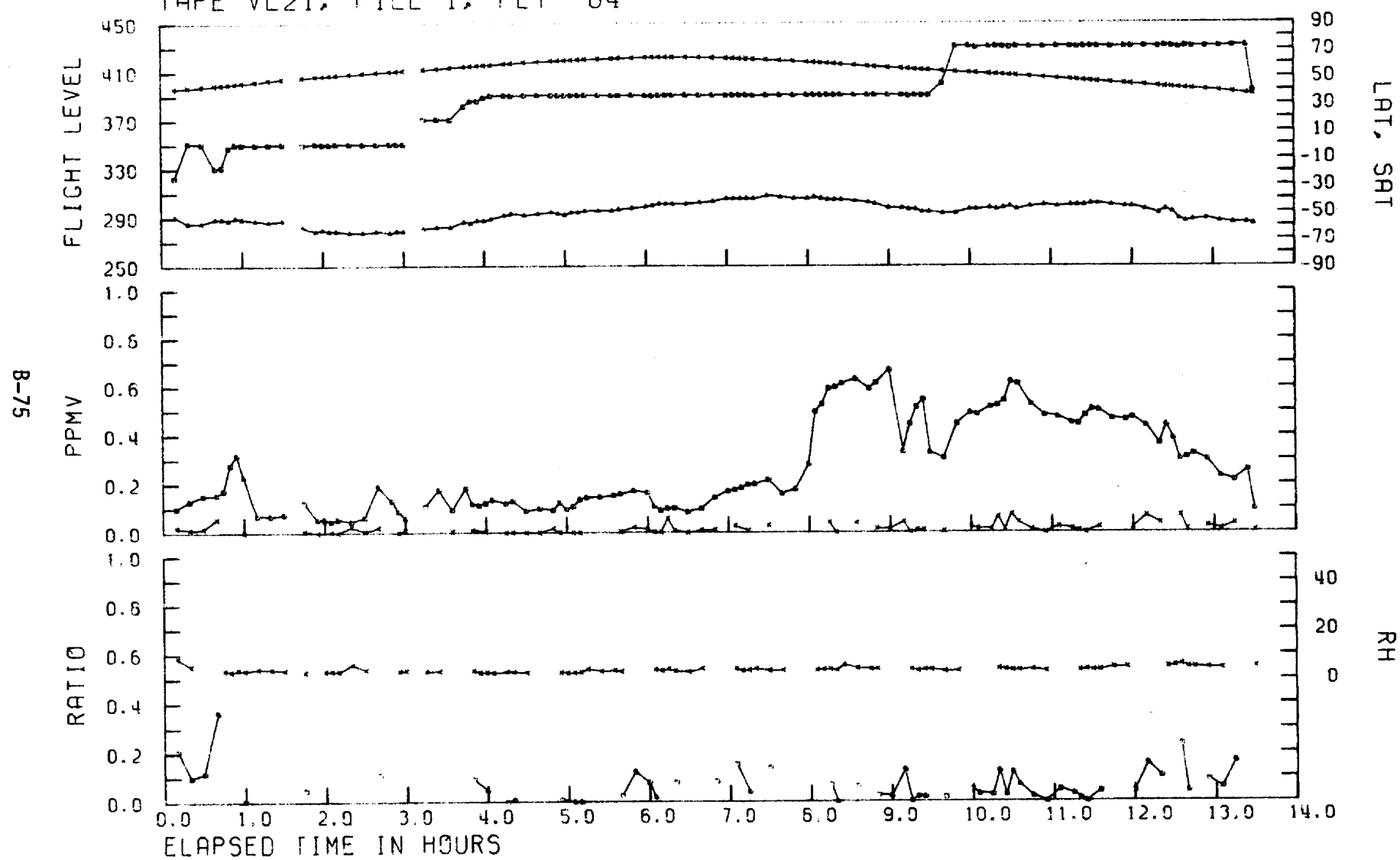
BOM TO BAH DEPARTURE 1 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 82



BAH TO JFK DEPARTURE 1 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 83

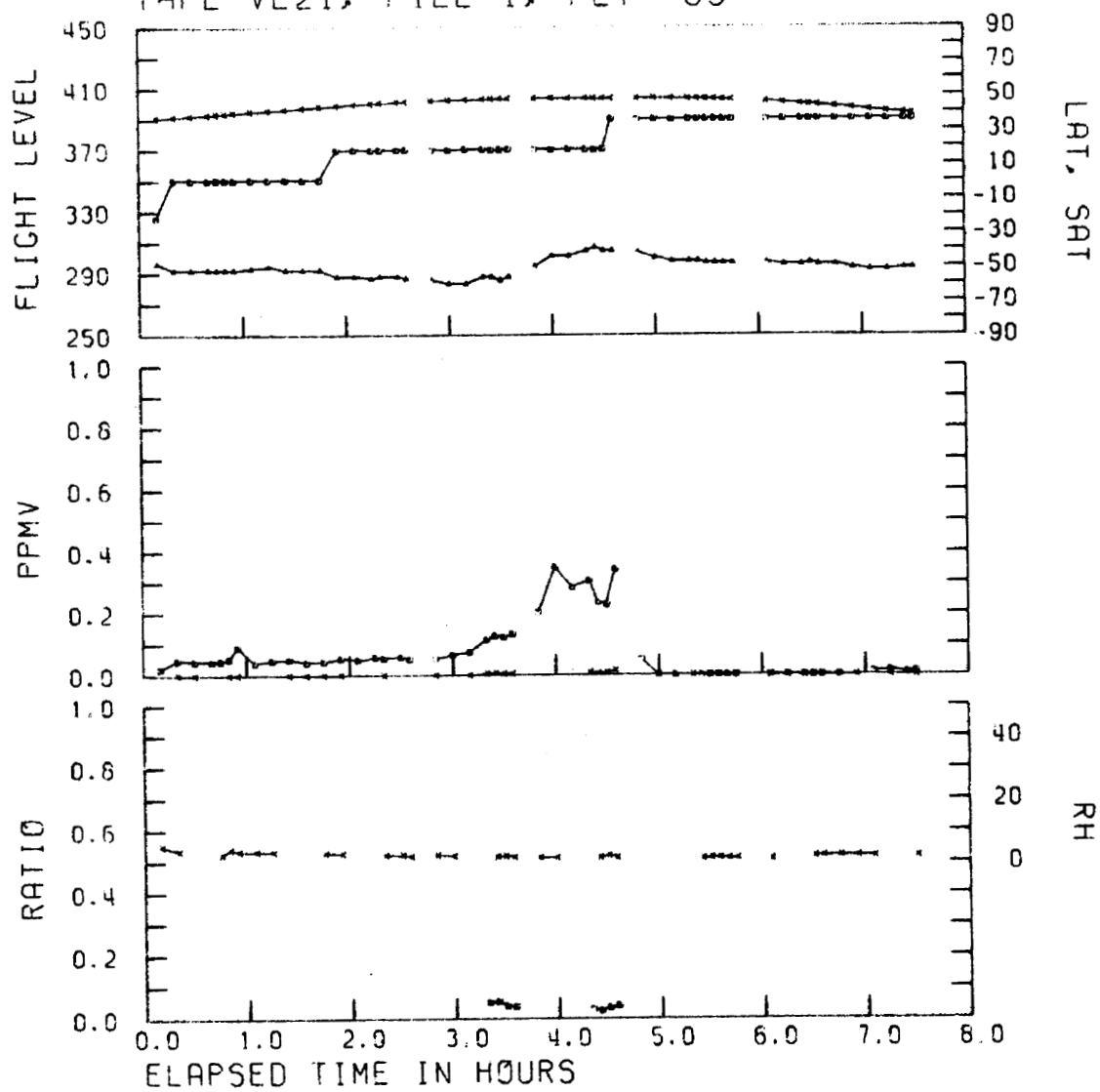


JFK TO NRT DEPARTURE 2 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 84

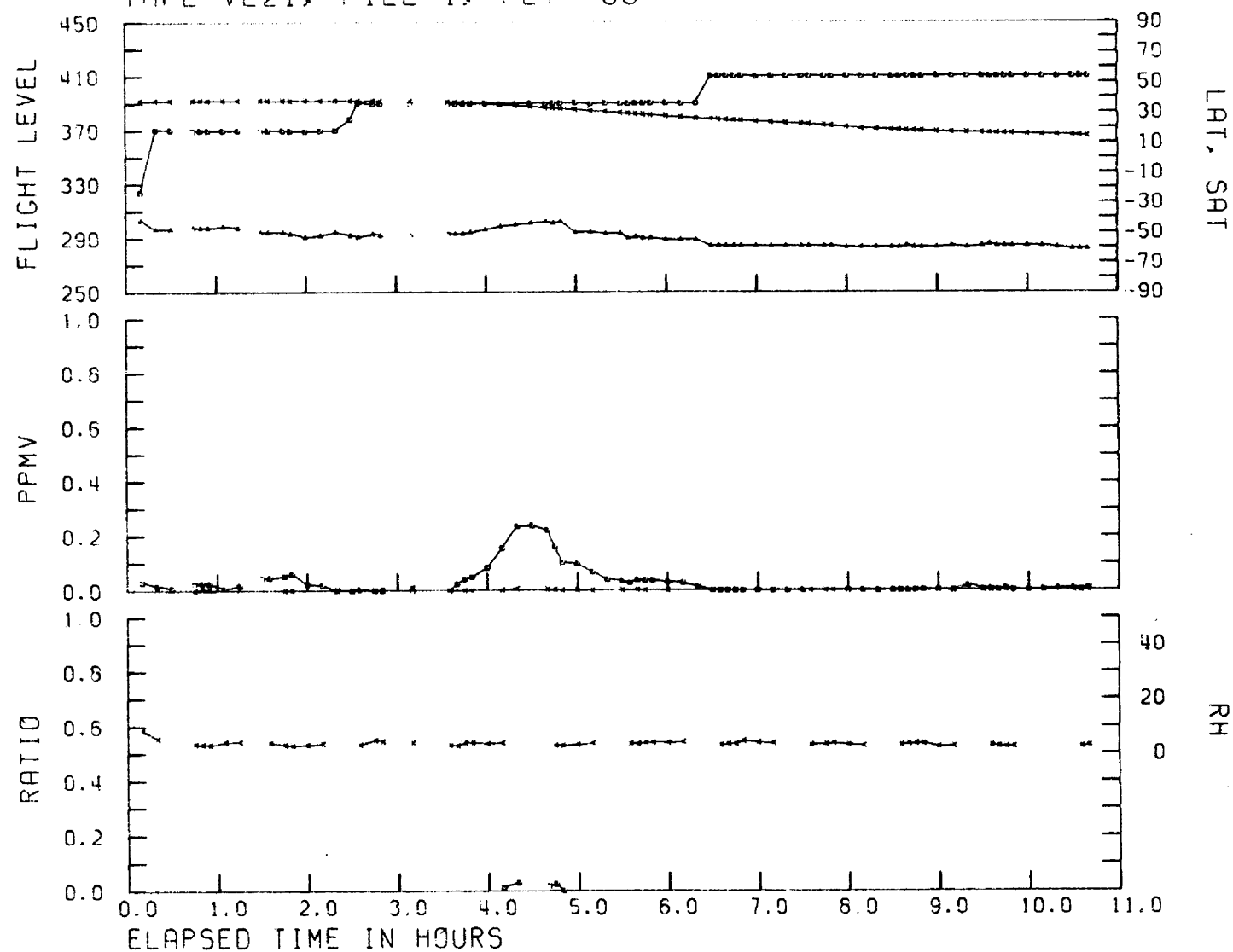


NRT TO SFO DEPARTURE 3 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 85

9/7-8

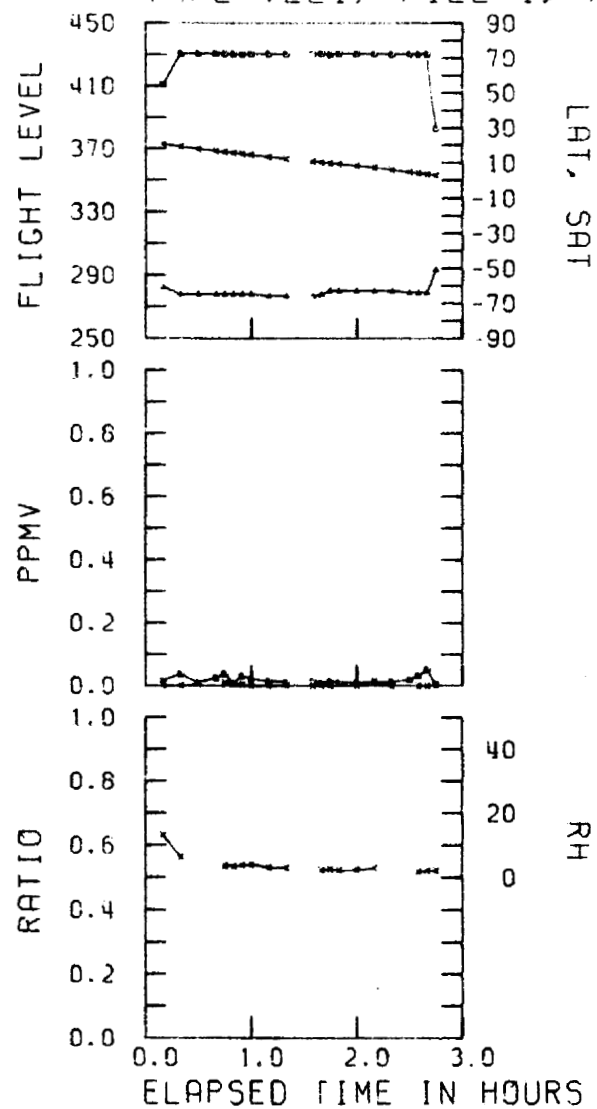


SFO TO GUM DEPARTURE 3 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 86

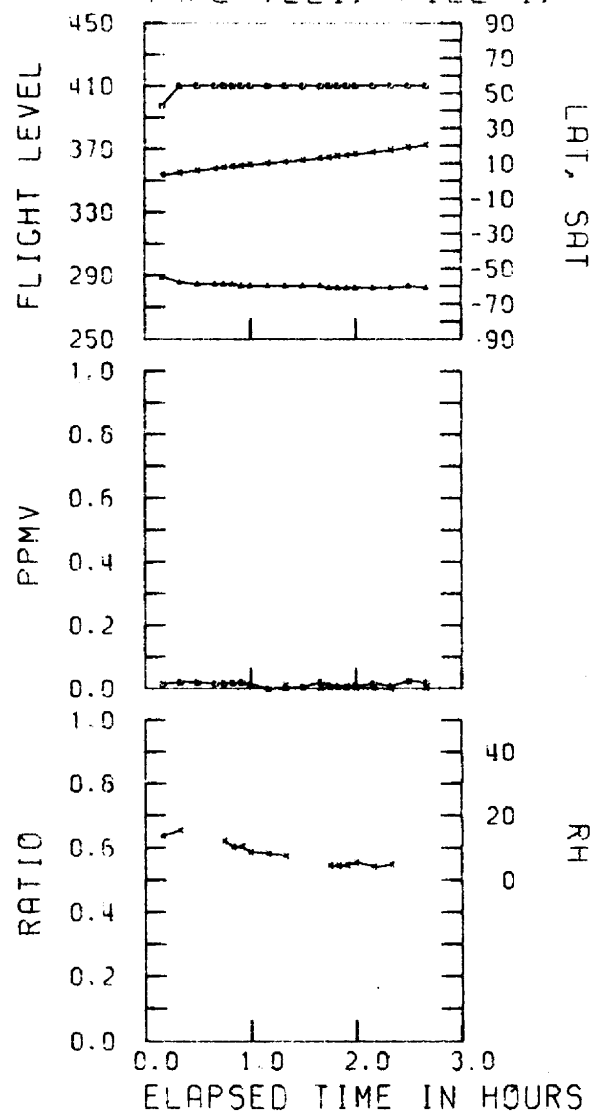


B-77

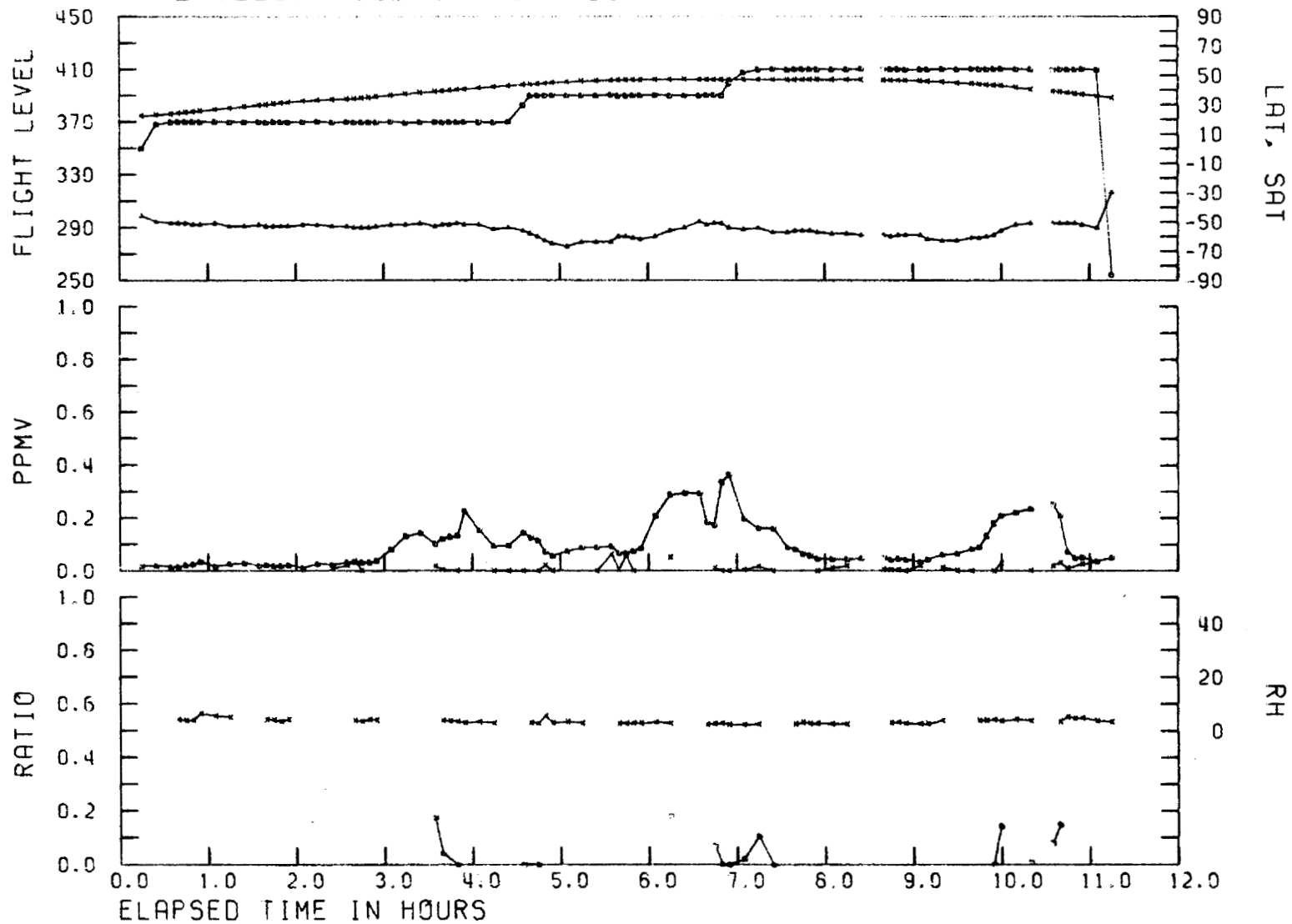
HKG TO SIN DEPARTURE 4 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 88



SIN TO HKG DEPARTURE 5 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 89

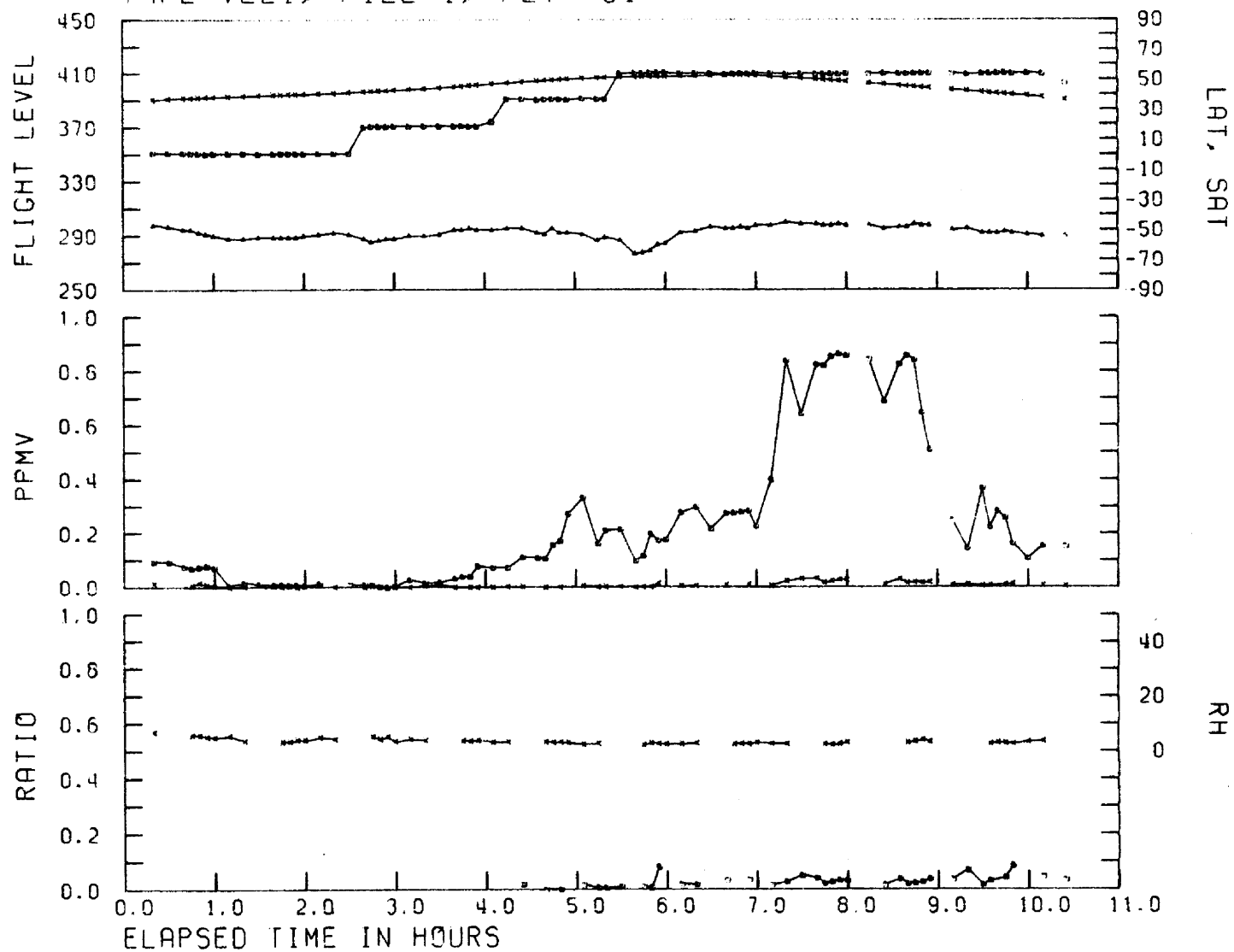


HKG TO LAX DEPARTURE 5 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 90

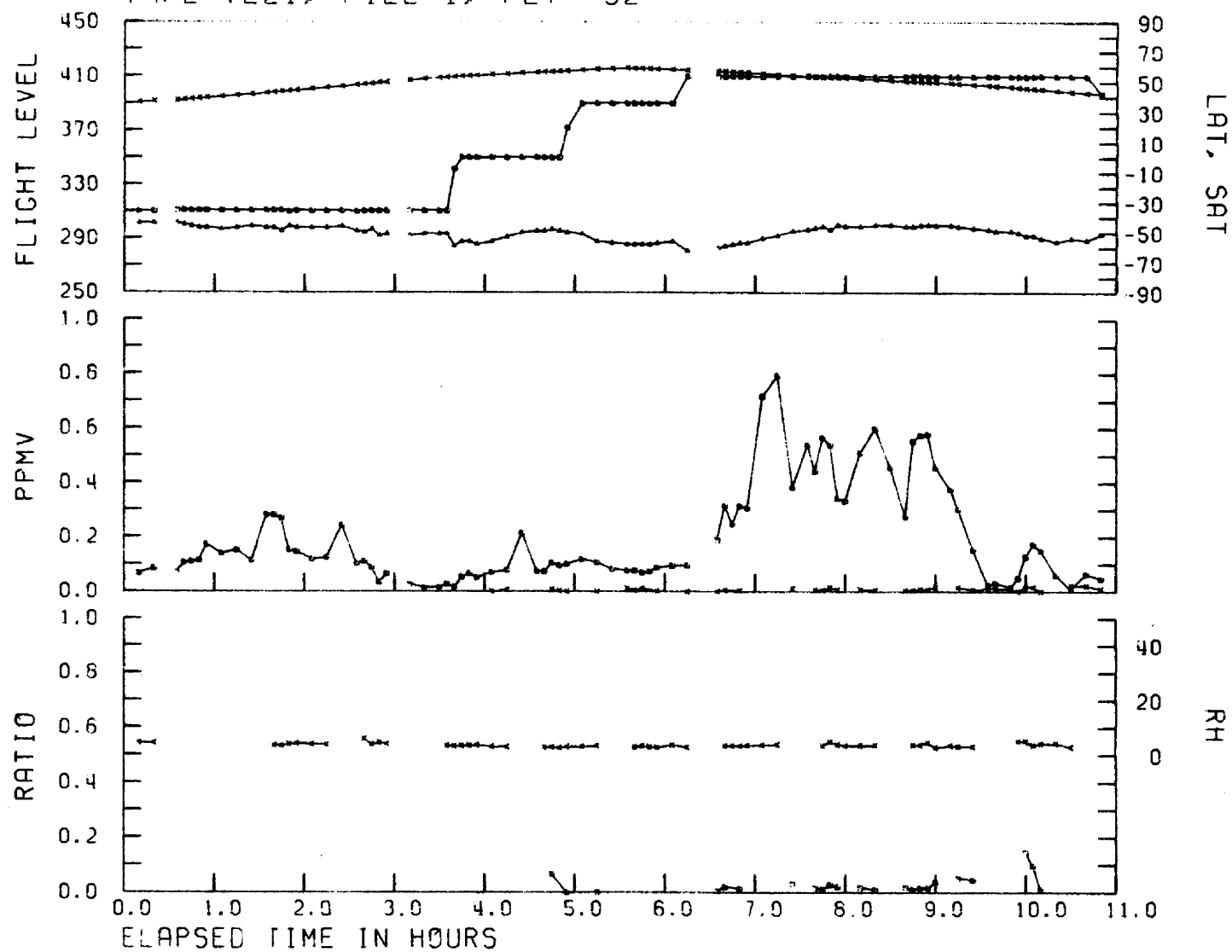


LAX TO NRT DEPARTURE 5 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 91

B-81

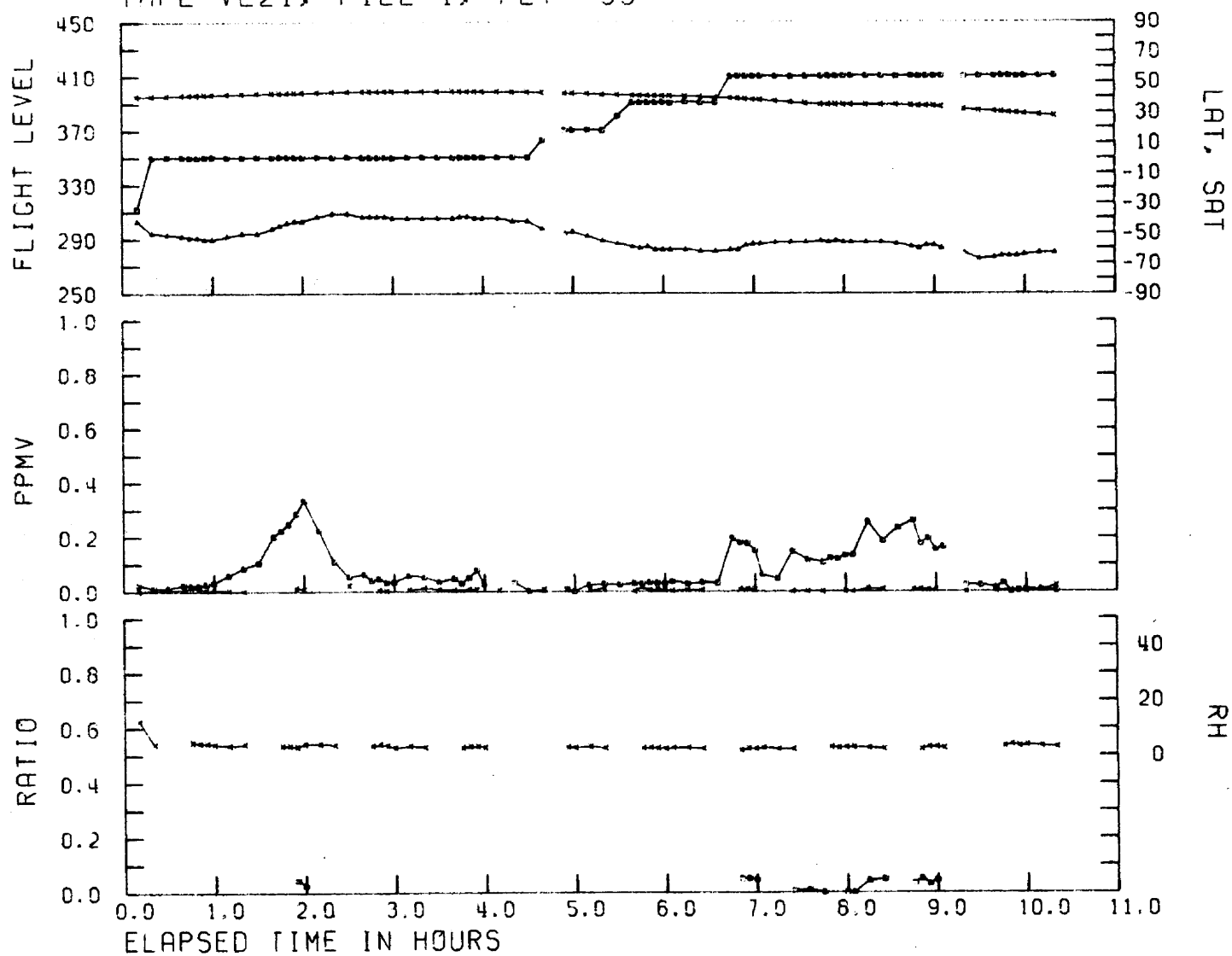


NRT TO JFK DEPARTURE 6 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 92

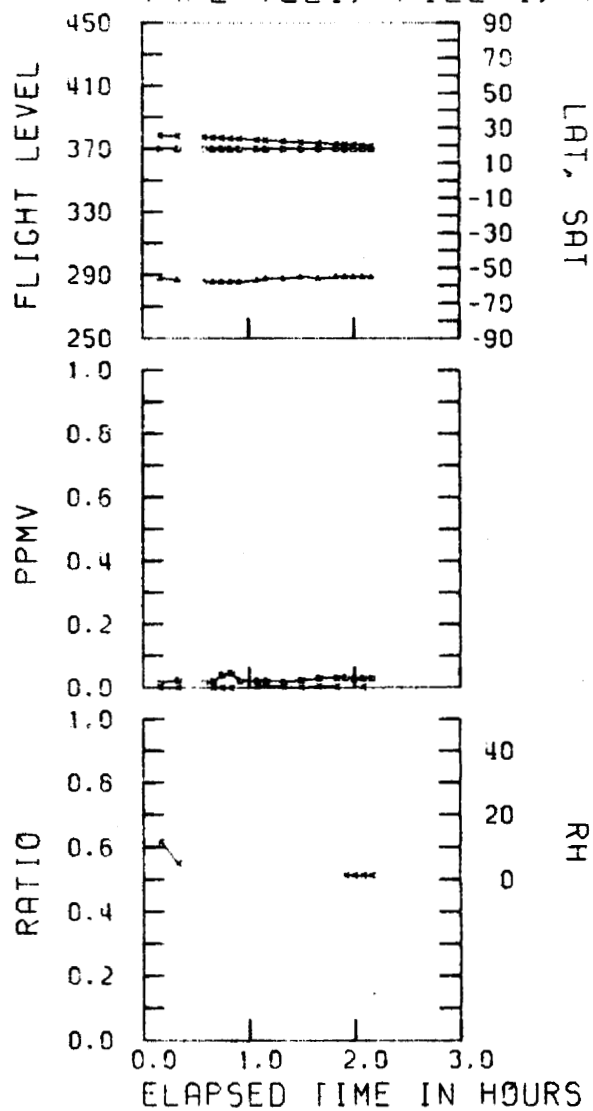


JFK TO BAH DEPARTURE 8 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 93

B-83

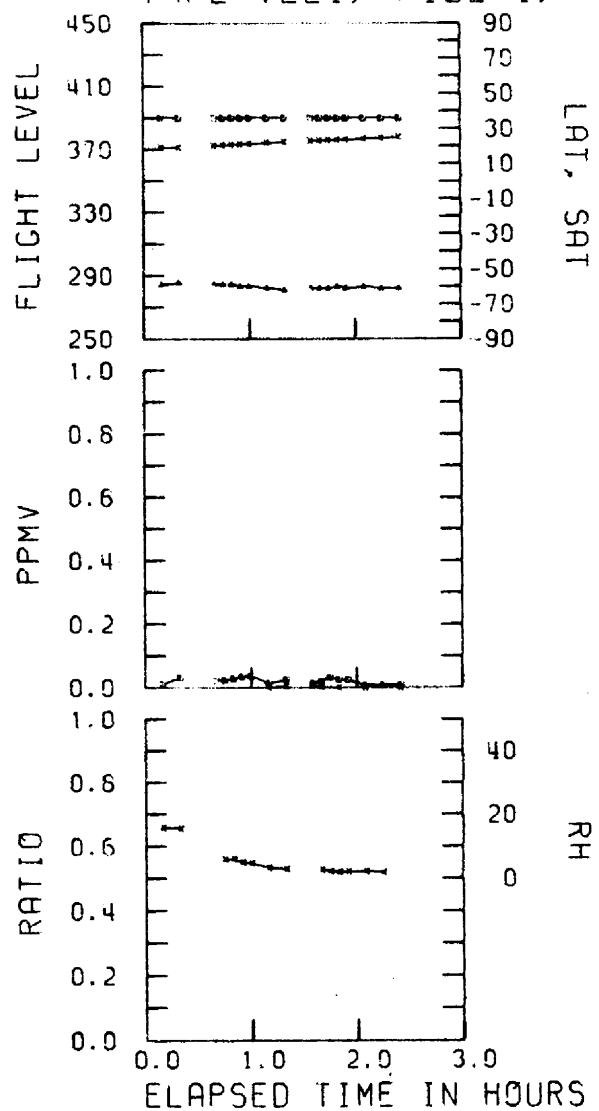


BAH TO BOM DEPARTURE 8 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 94

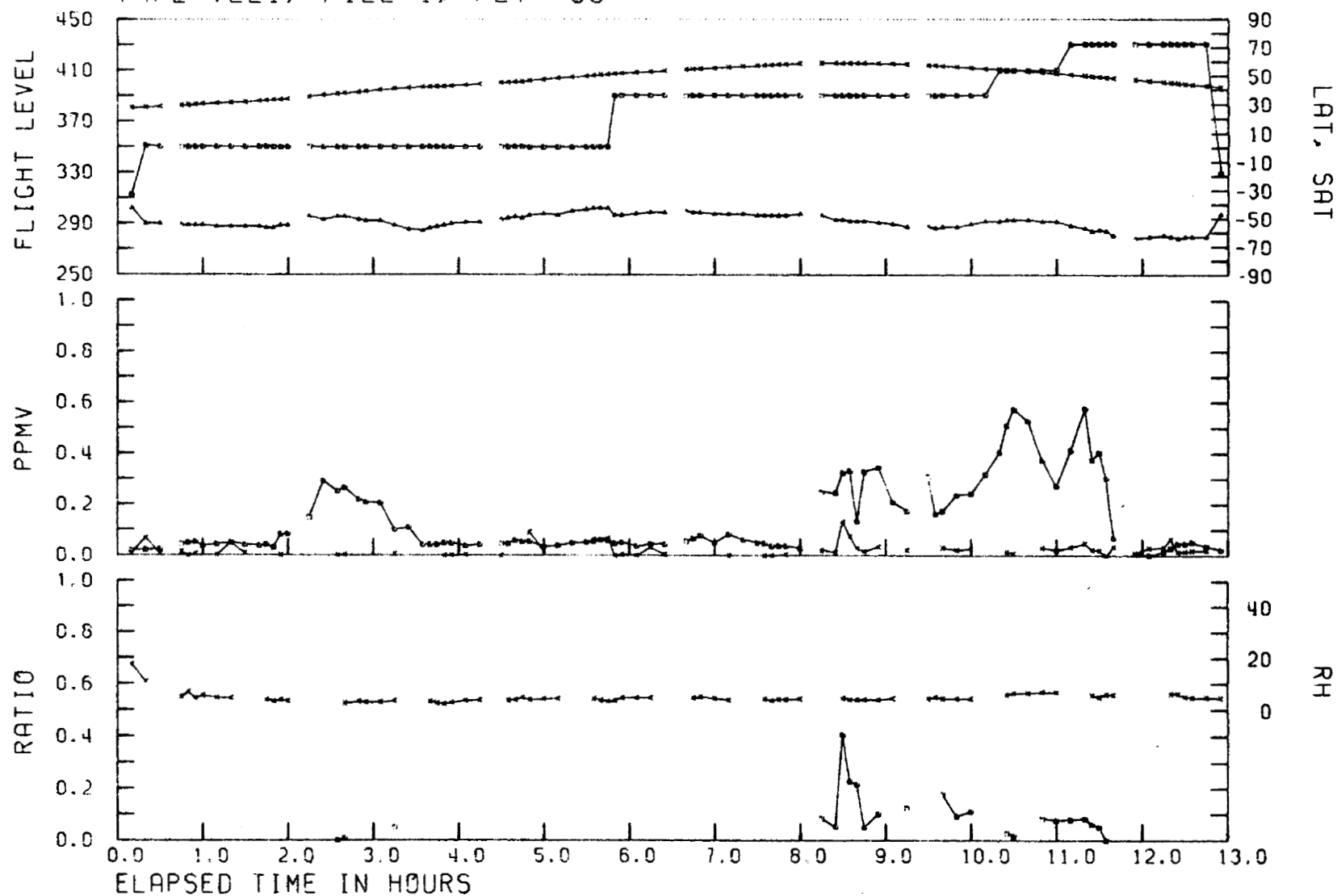


B-84

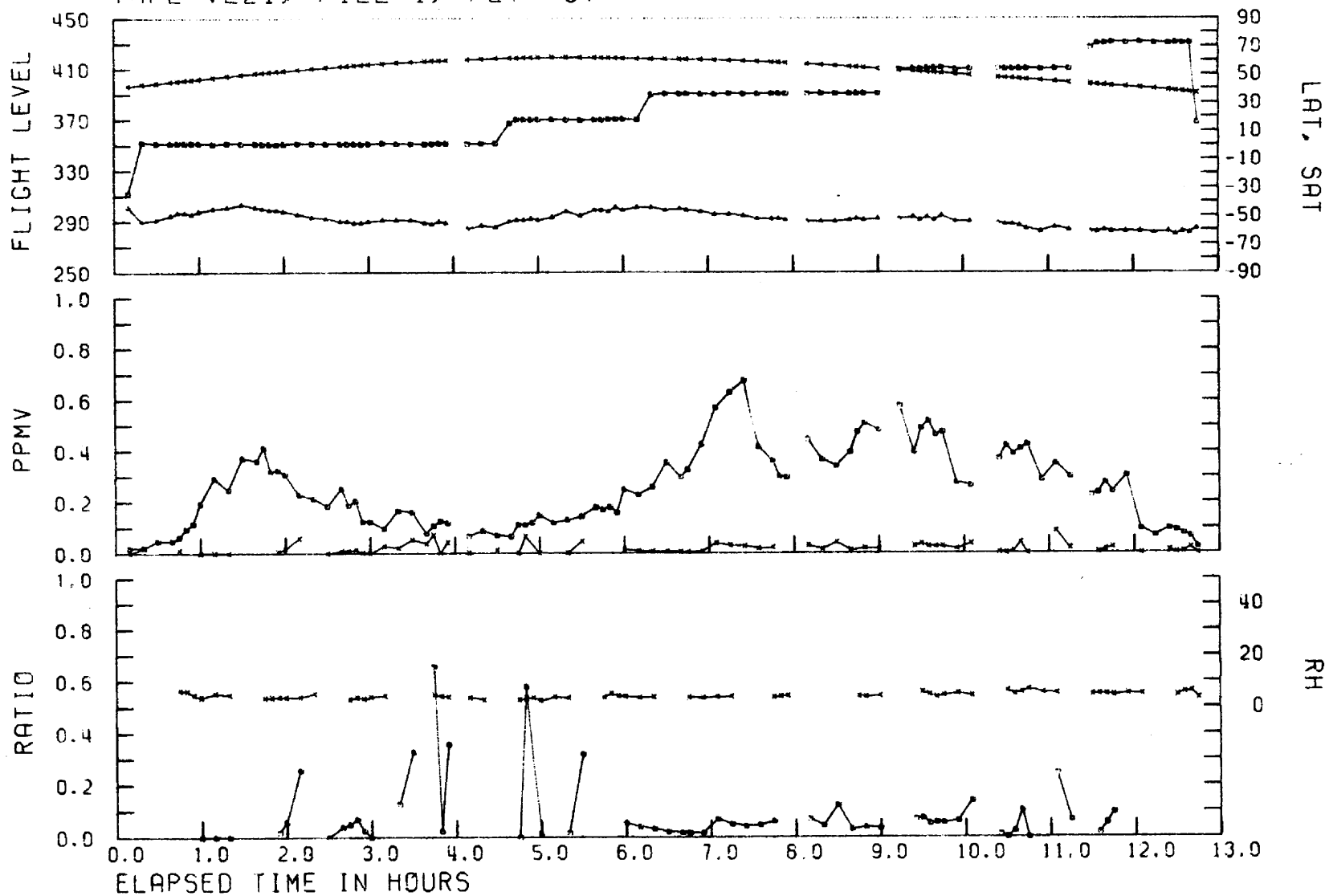
BOM TO BAH DEPARTURE 8 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 95



BAH TO JFK DEPARTURE 8 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 96

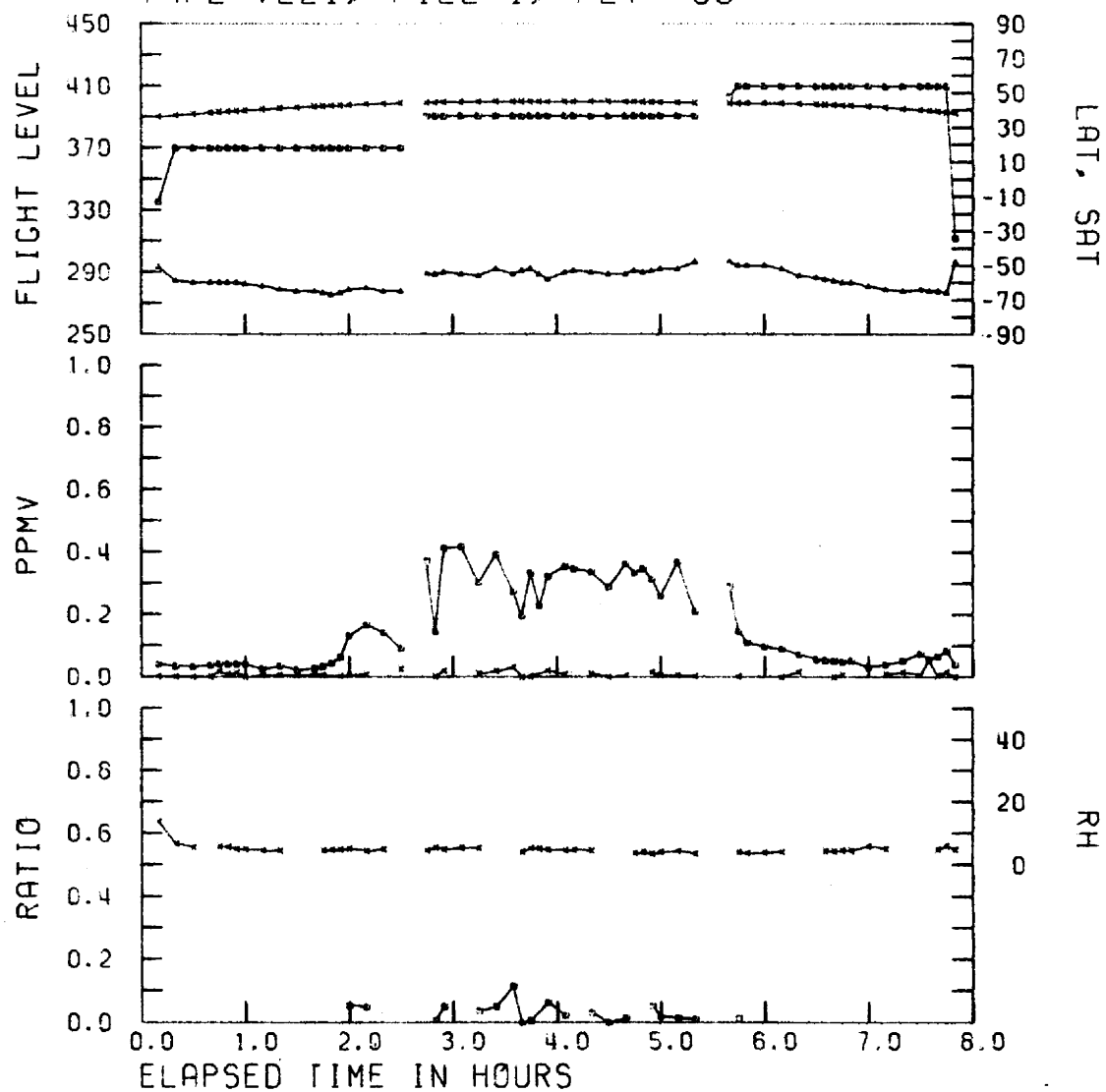


JFK TO NRT DEPARTURE 9 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 97

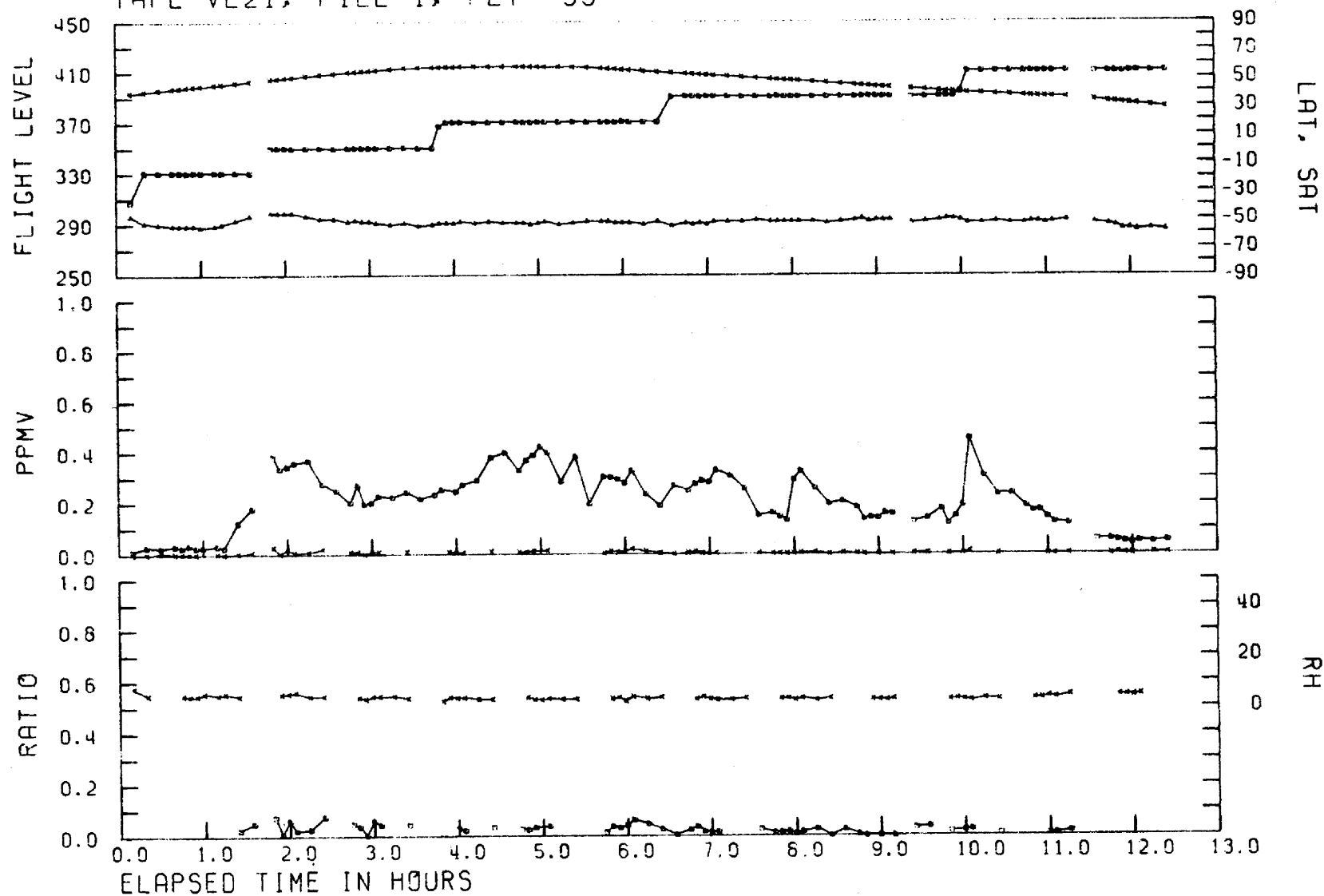


B-87

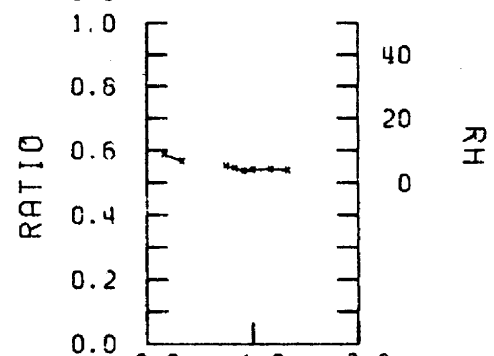
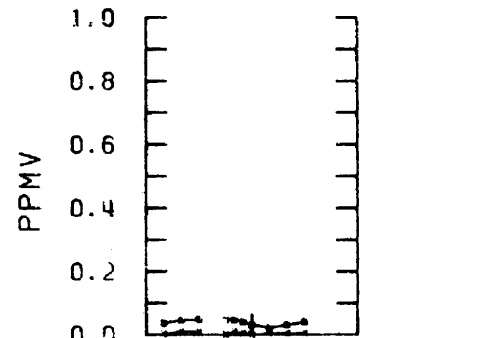
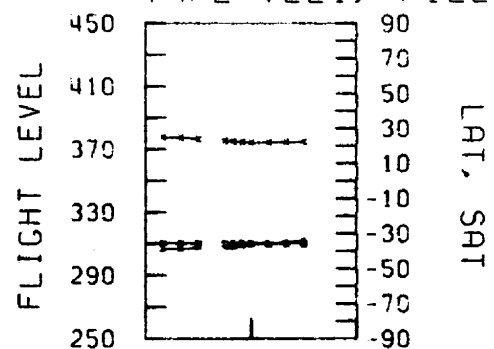
NRT TO SFO DEPARTURE 10 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 98



SFO TO OKA DEPARTURE 10 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 99

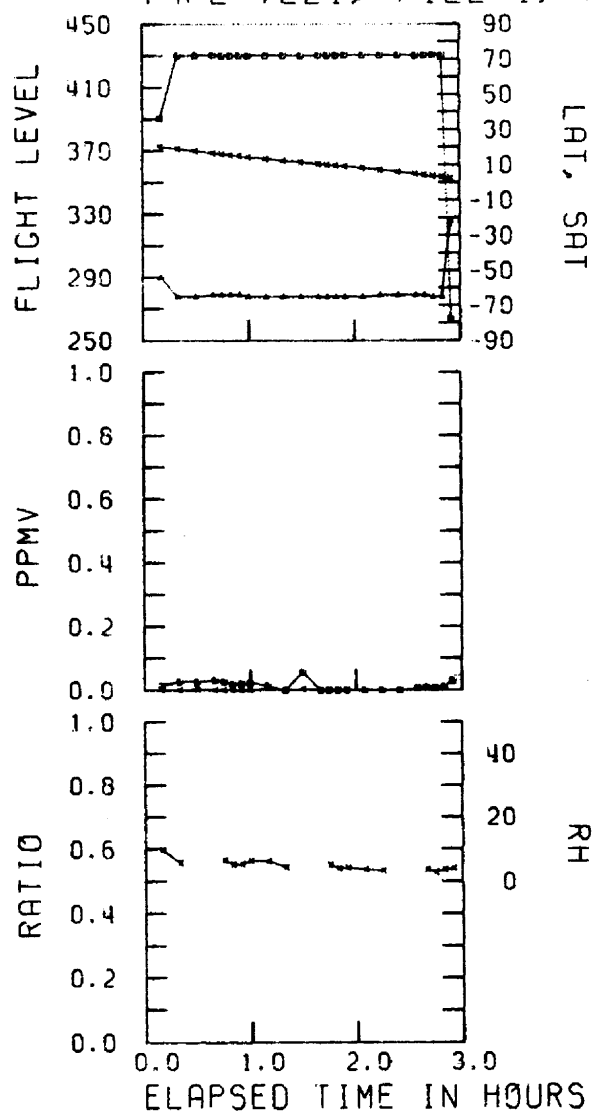


OKA TO HKG DEPARTURE 11 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 100

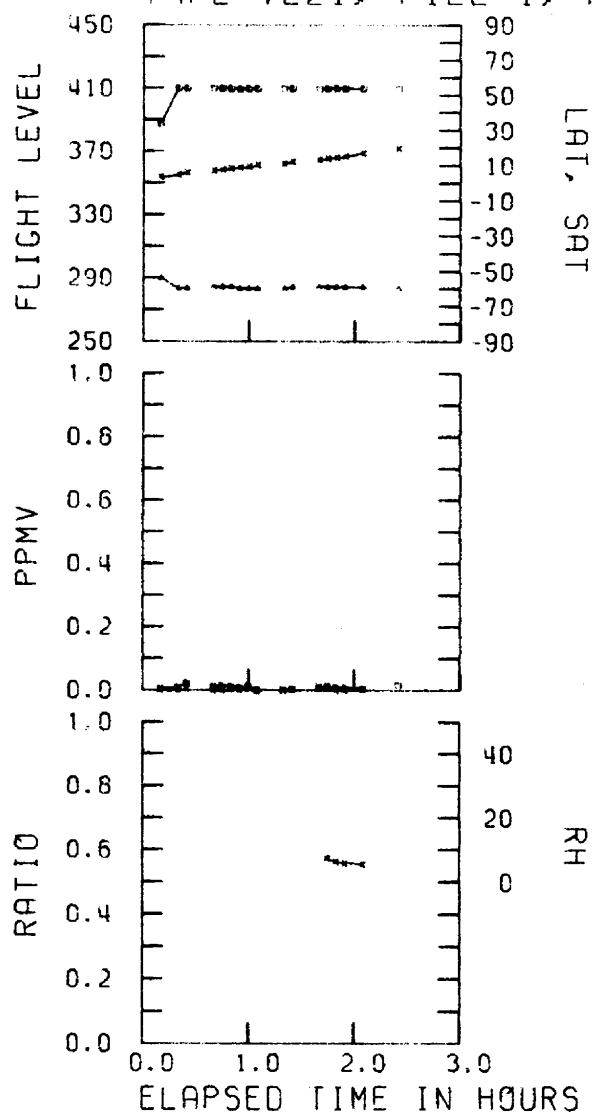


ELAPSED TIME IN HOURS

HKG TO SIN DEPARTURE 11 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 101

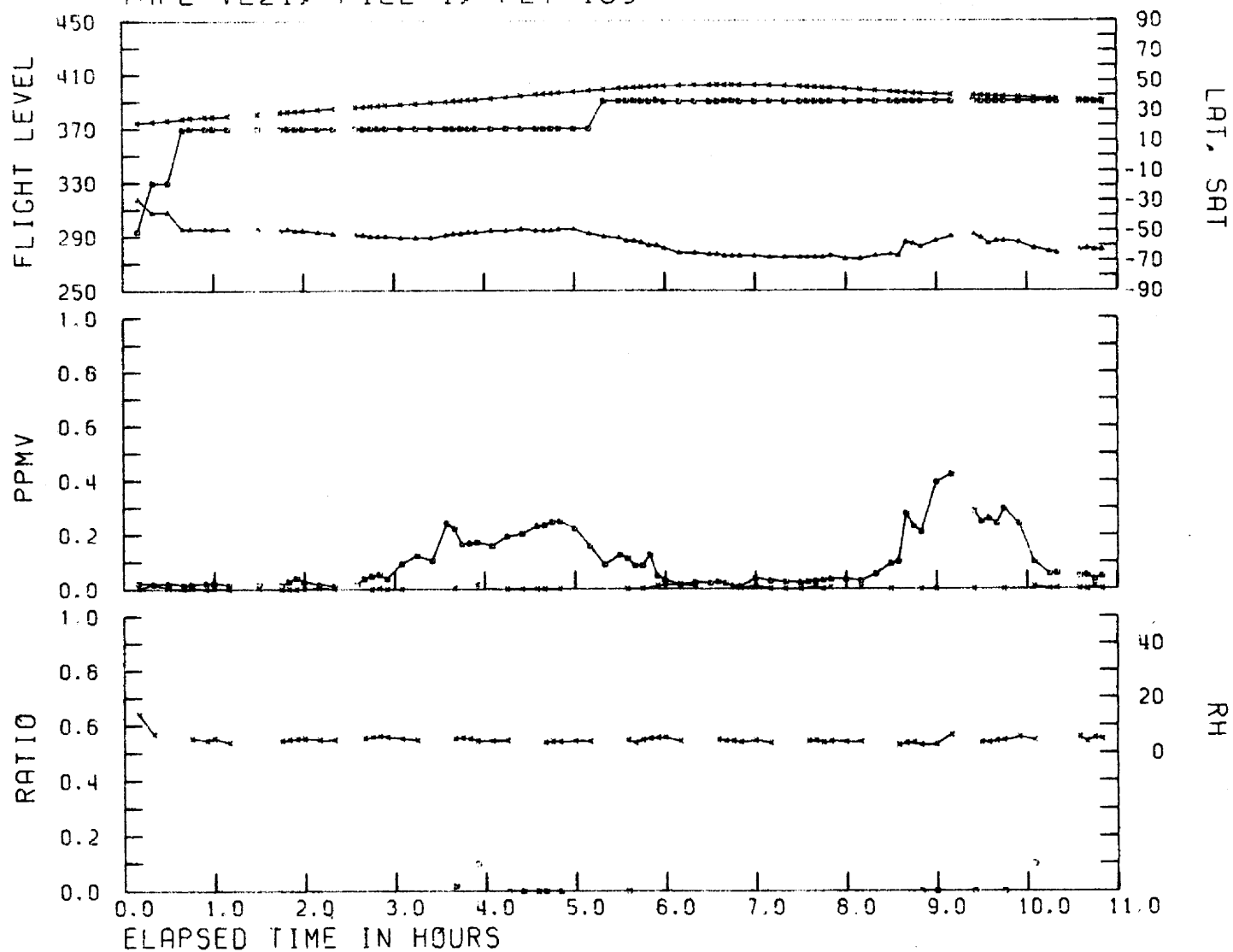


SIN TO HKG DEPARTURE 12 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 102



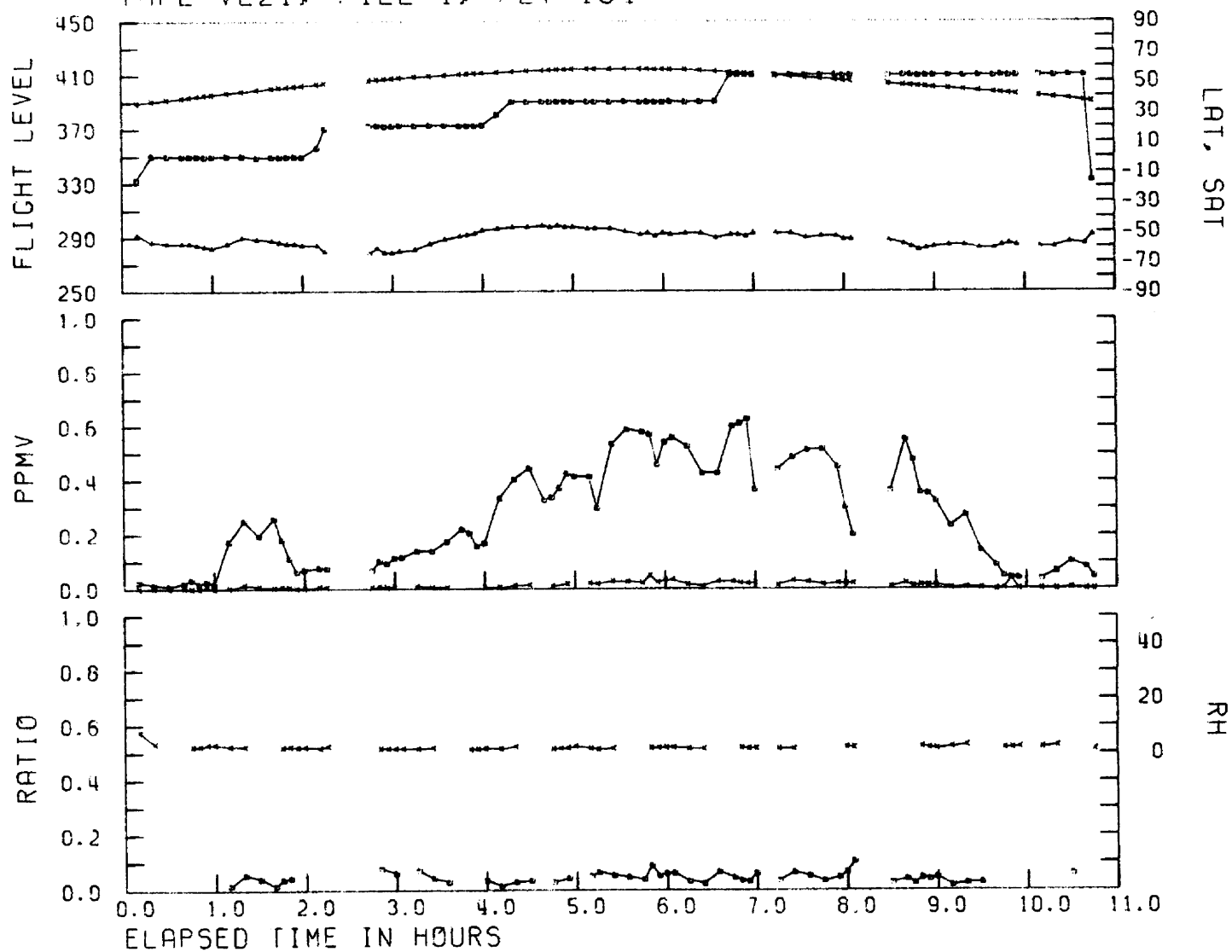
B-92

HKG TO LAX DEPARTURE 12 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 103



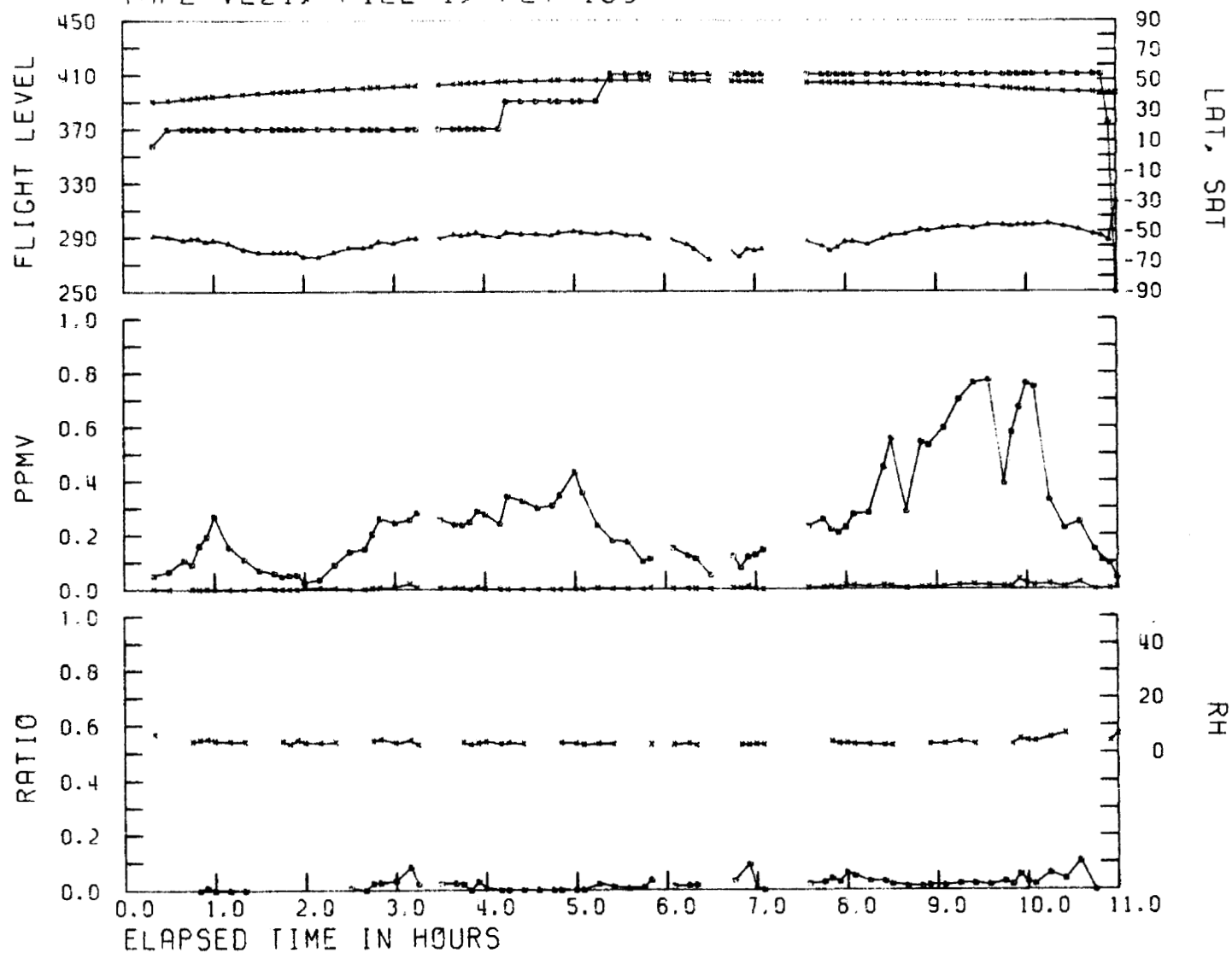
B-93

LAX TO NRT DEPARTURE 12 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 104



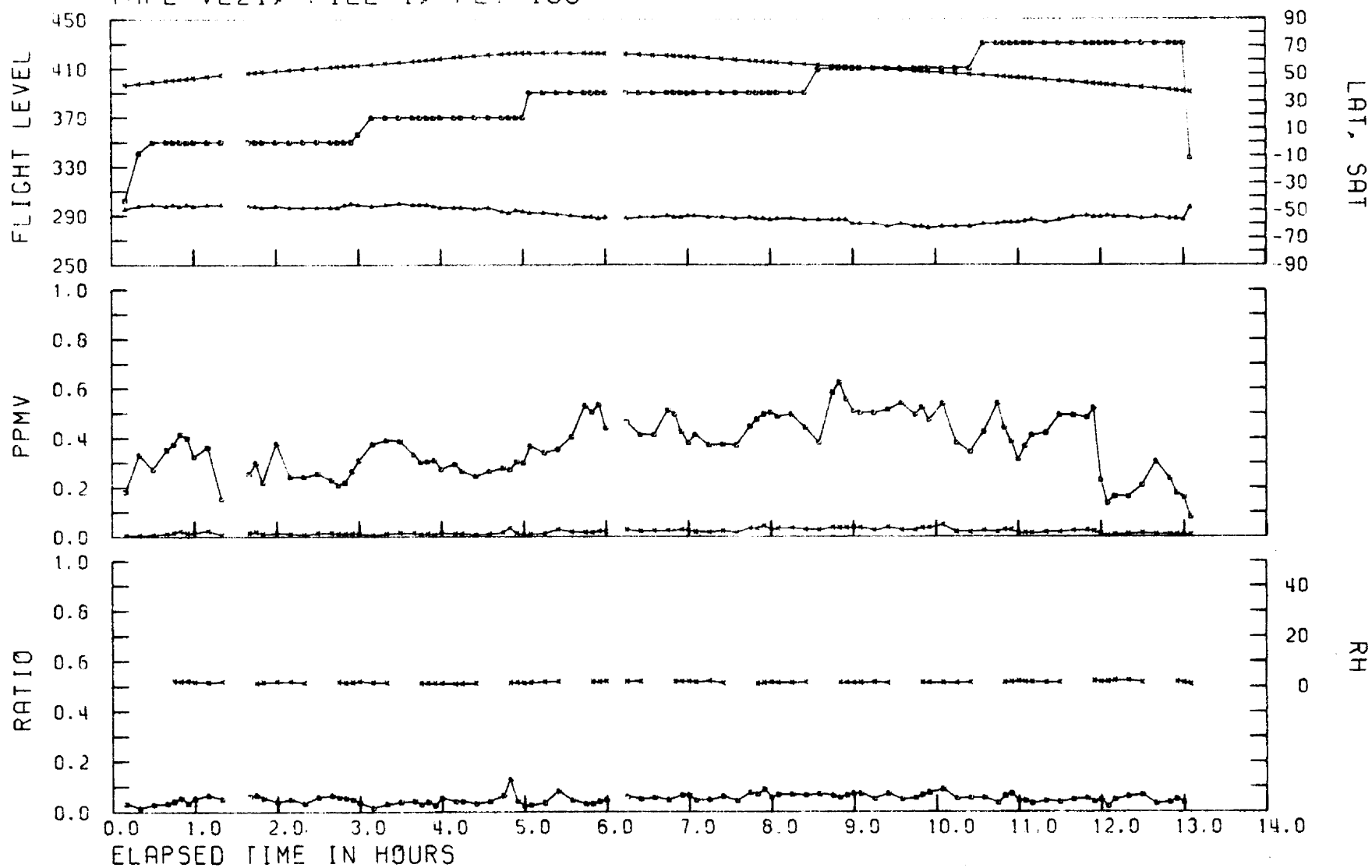
B-94

NRT TO JFK DEPARTURE 13 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 105

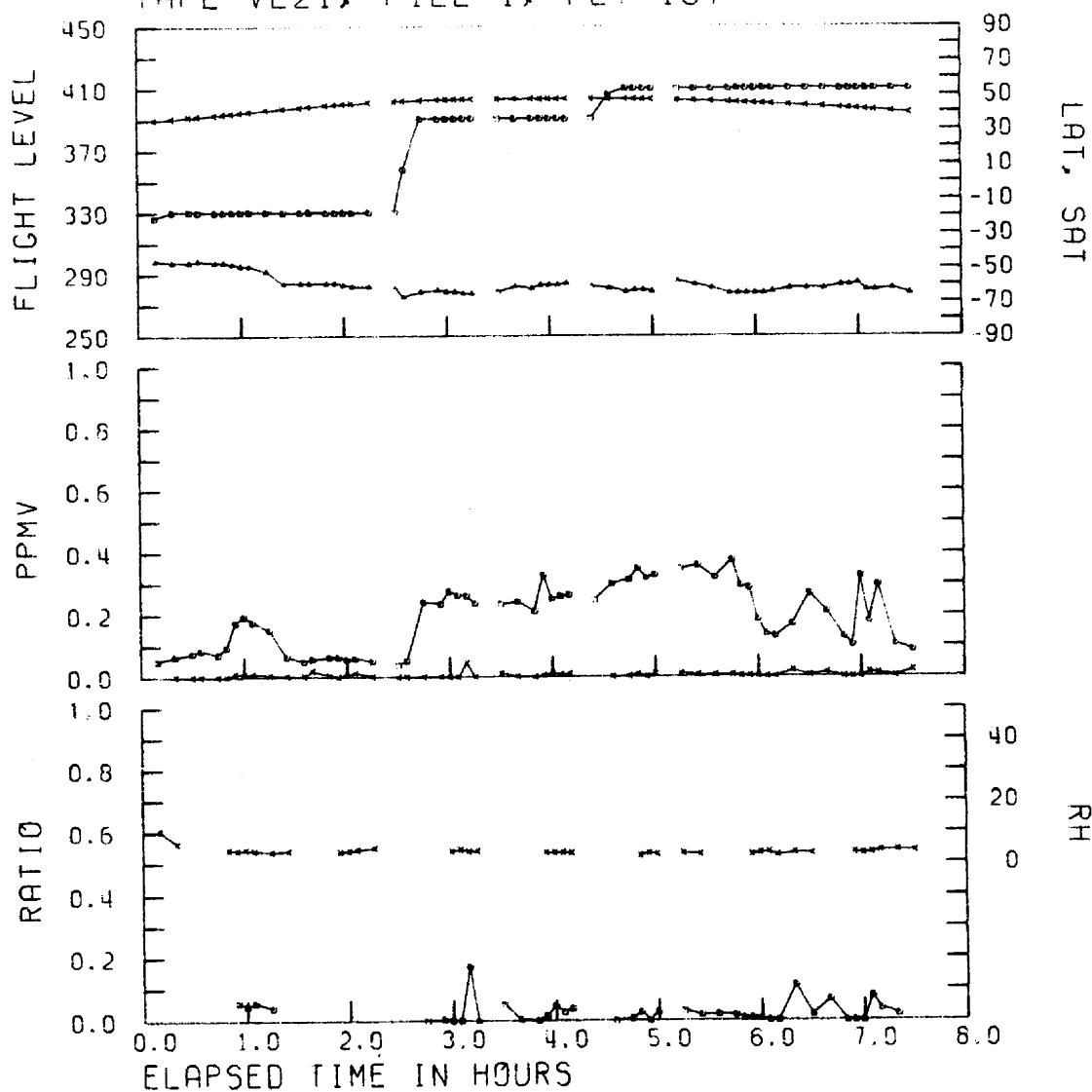


JFK TO NRT DEPARTURE 14 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 106

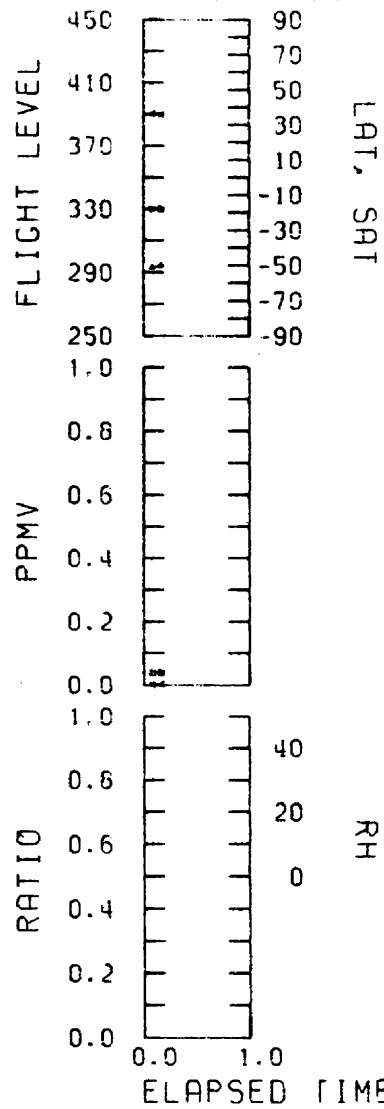
96-B



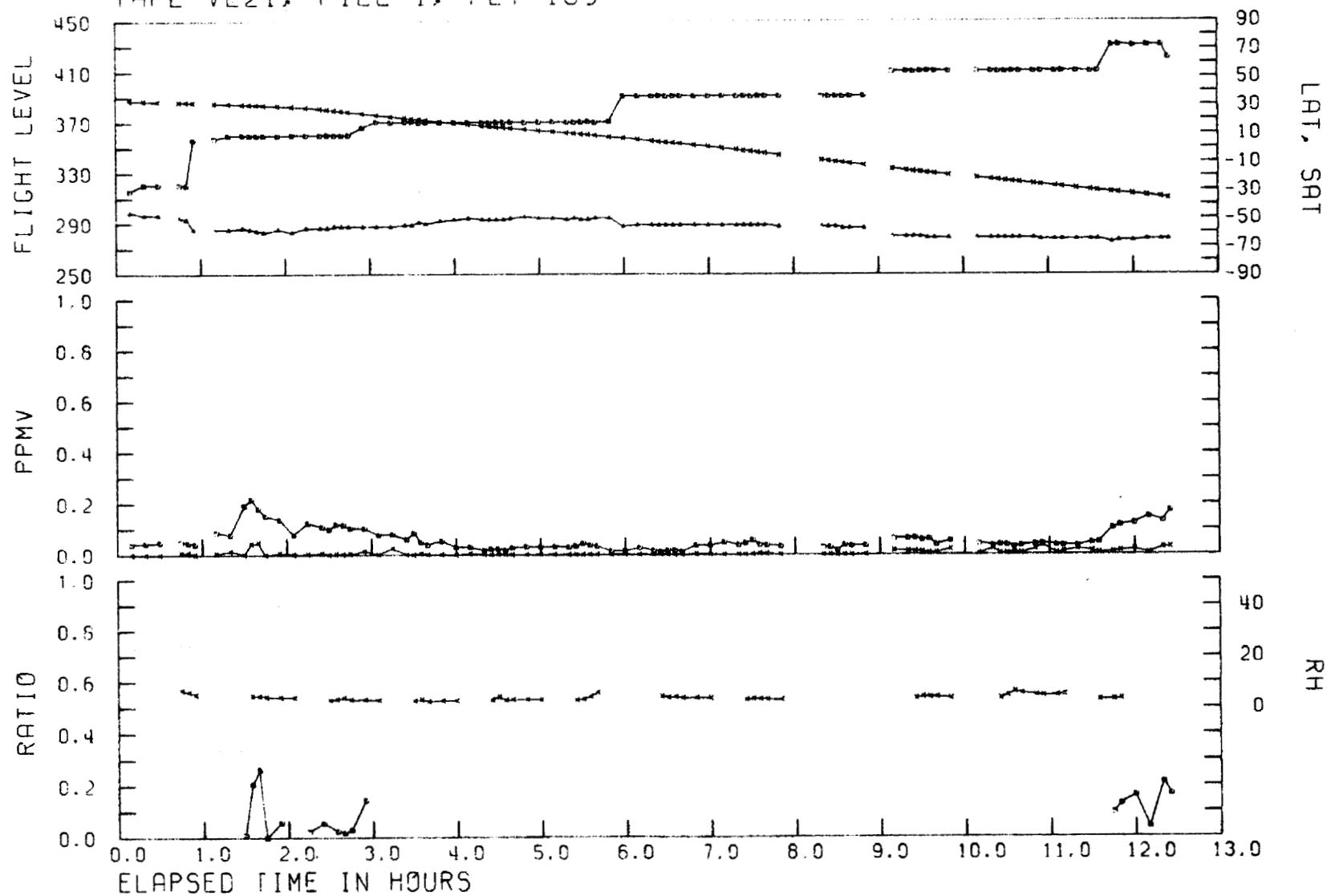
NRT TO SFO DEPARTURE 15 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 107



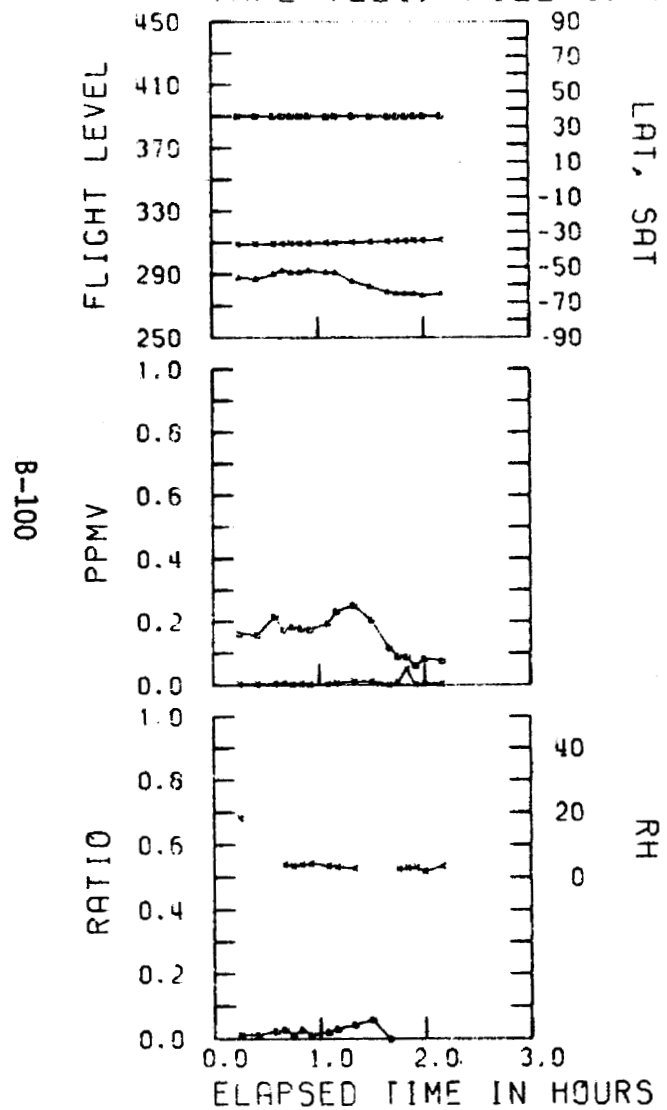
SFO TO LAX DEPARTURE 15 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 108



LAX TO AKL DEPARTURE 16 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 109

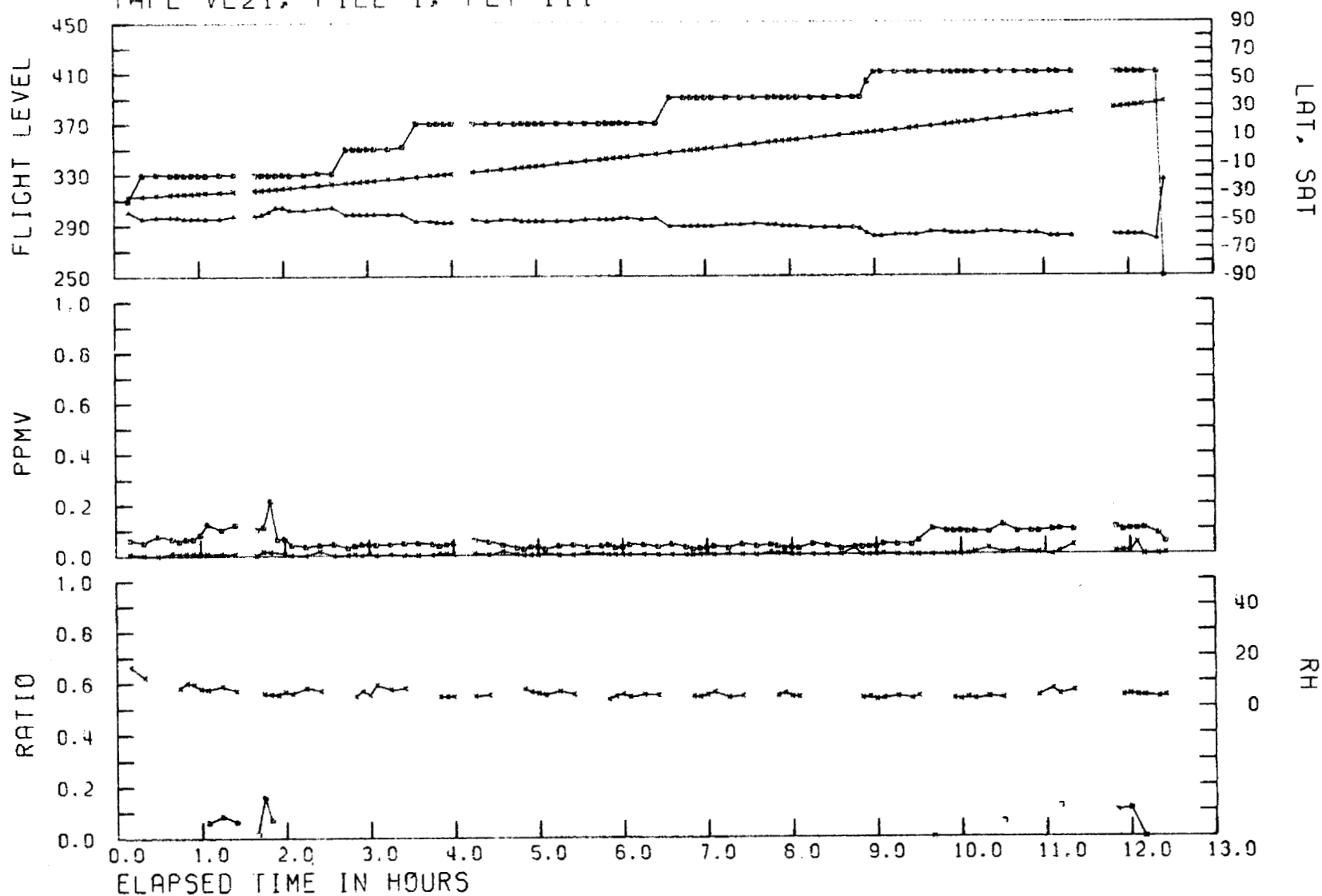


AKL TO SYD DEPARTURE 16 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 110

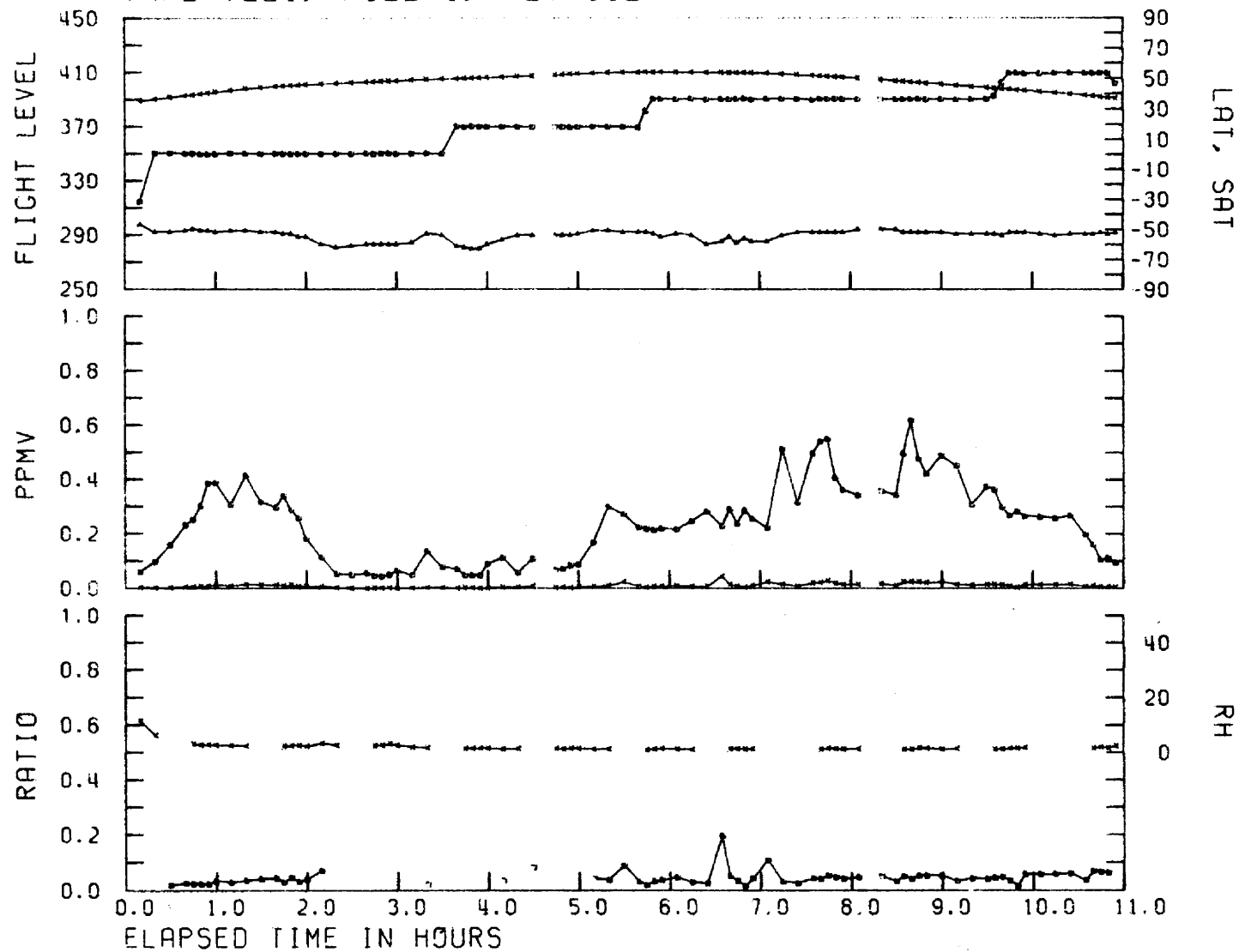


SYD TO LAX DEPARTURE 17 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 111

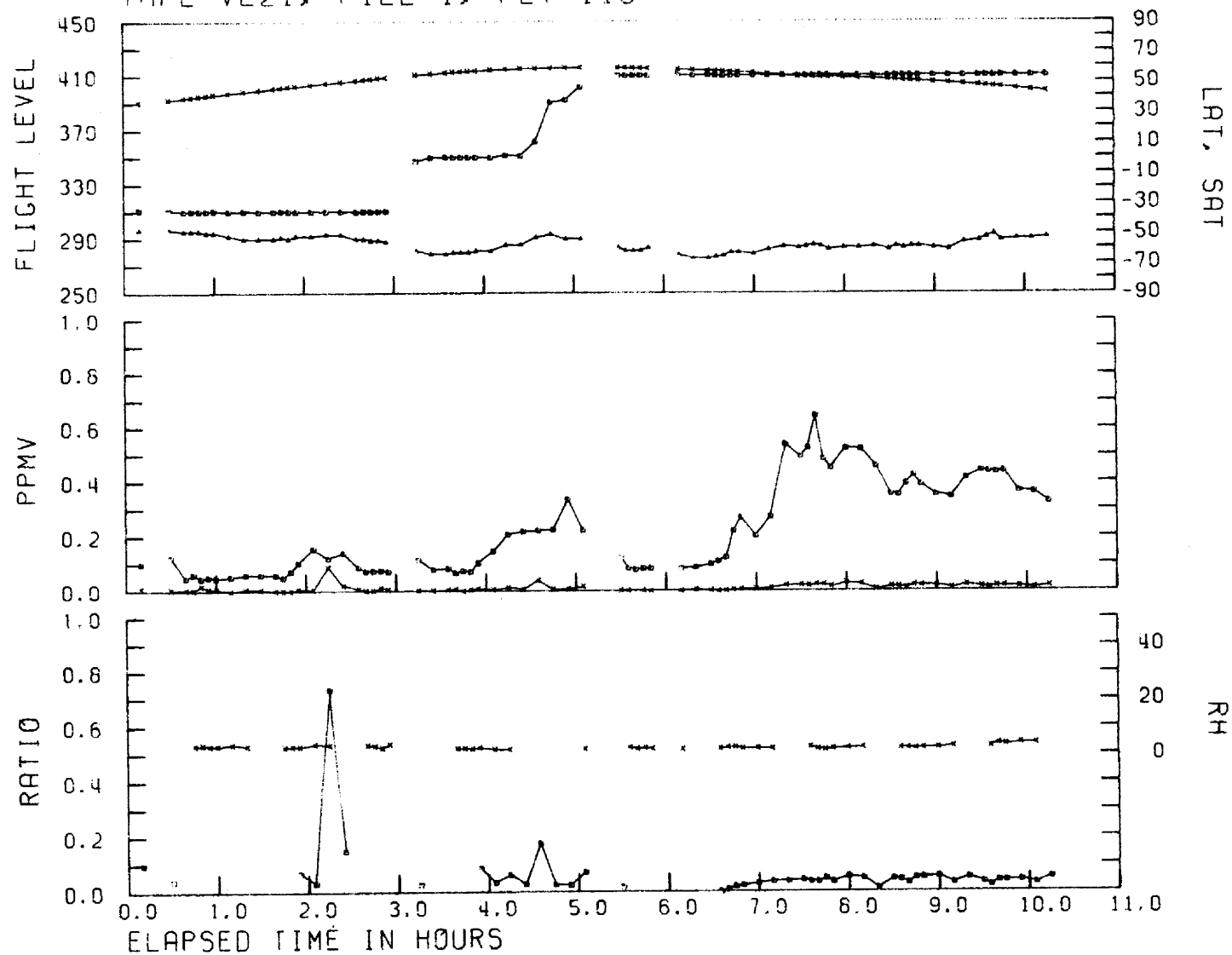
B-101



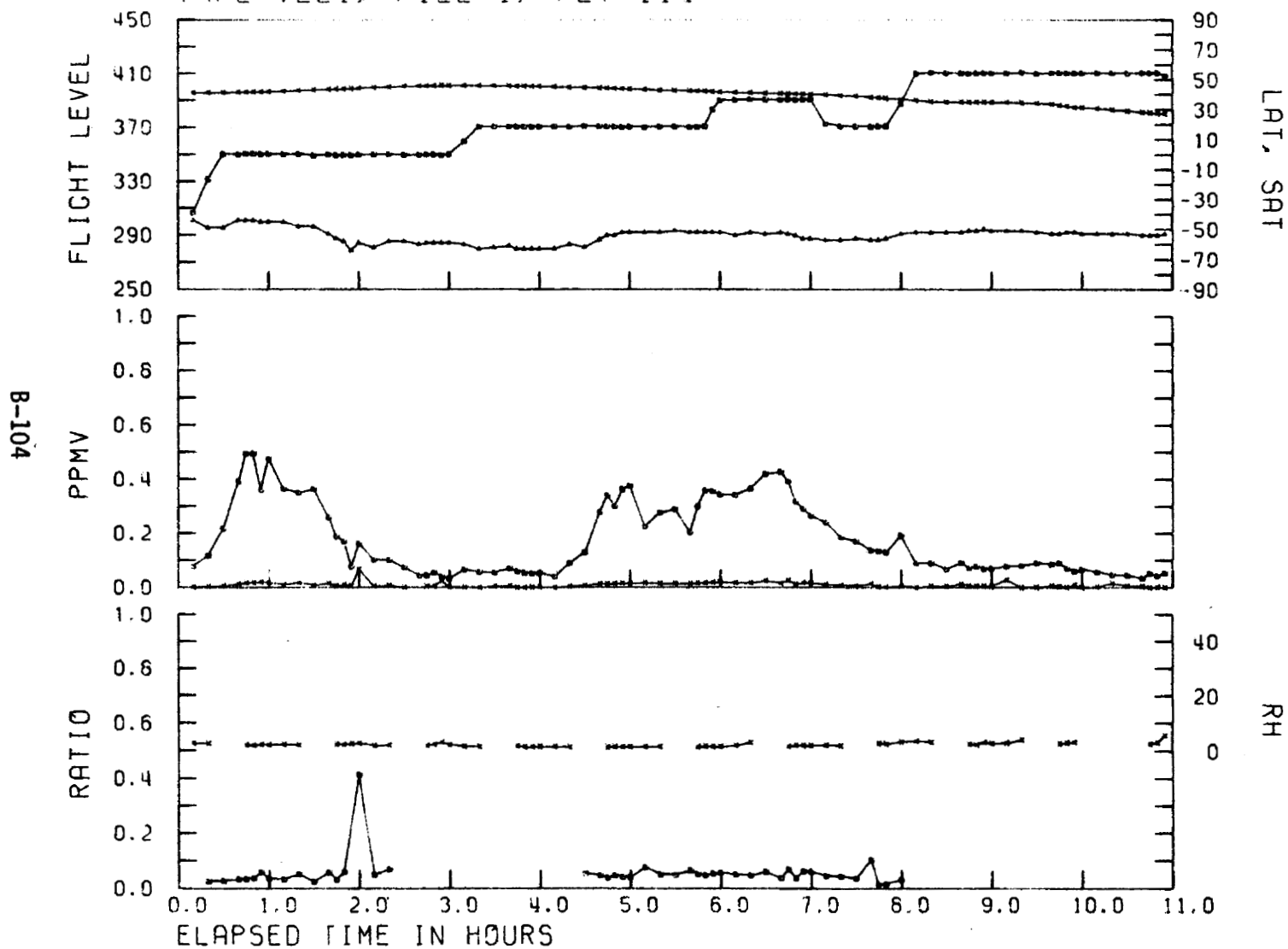
LAX TO NRT DEPARTURE 17 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 112



NRT TO JFK DEPARTURE 18 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 113

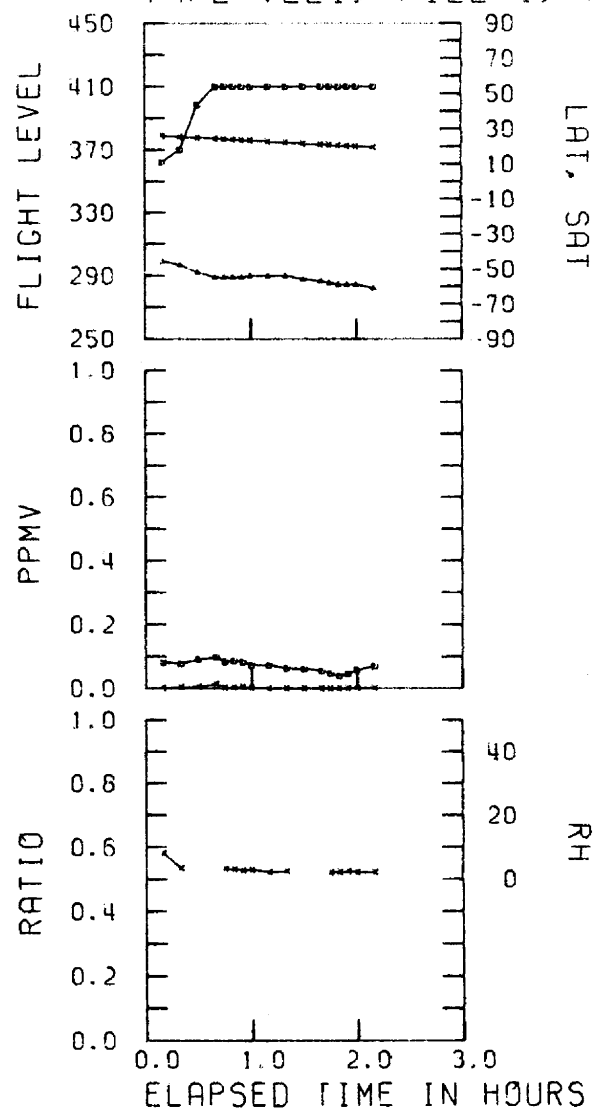


JFK TO BAH DEPARTURE 19 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 114

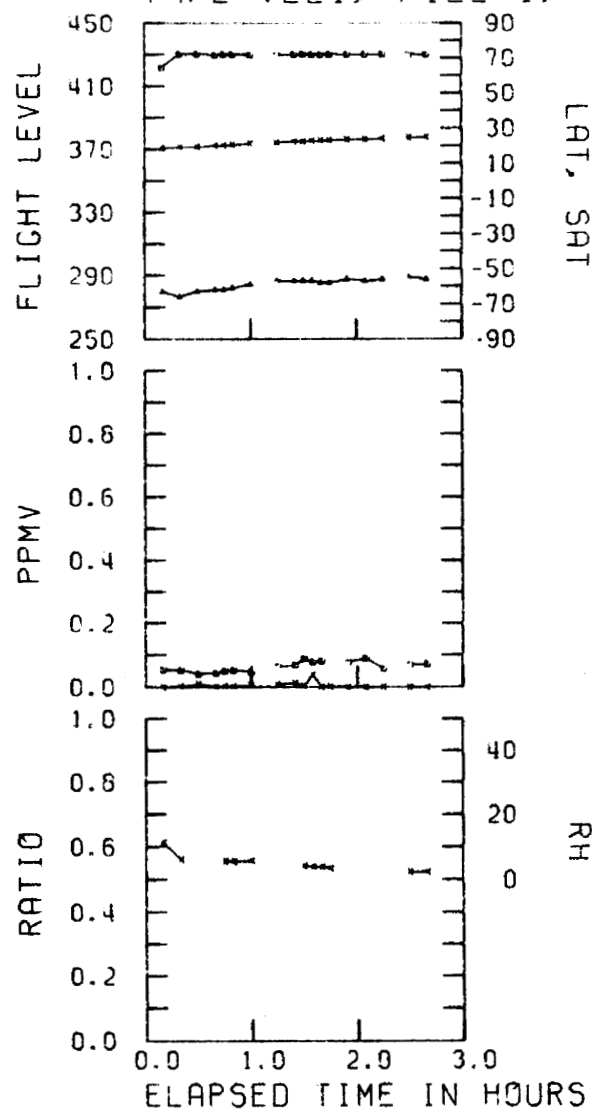


BAH TO BOM DEPARTURE 20 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 115

B-105

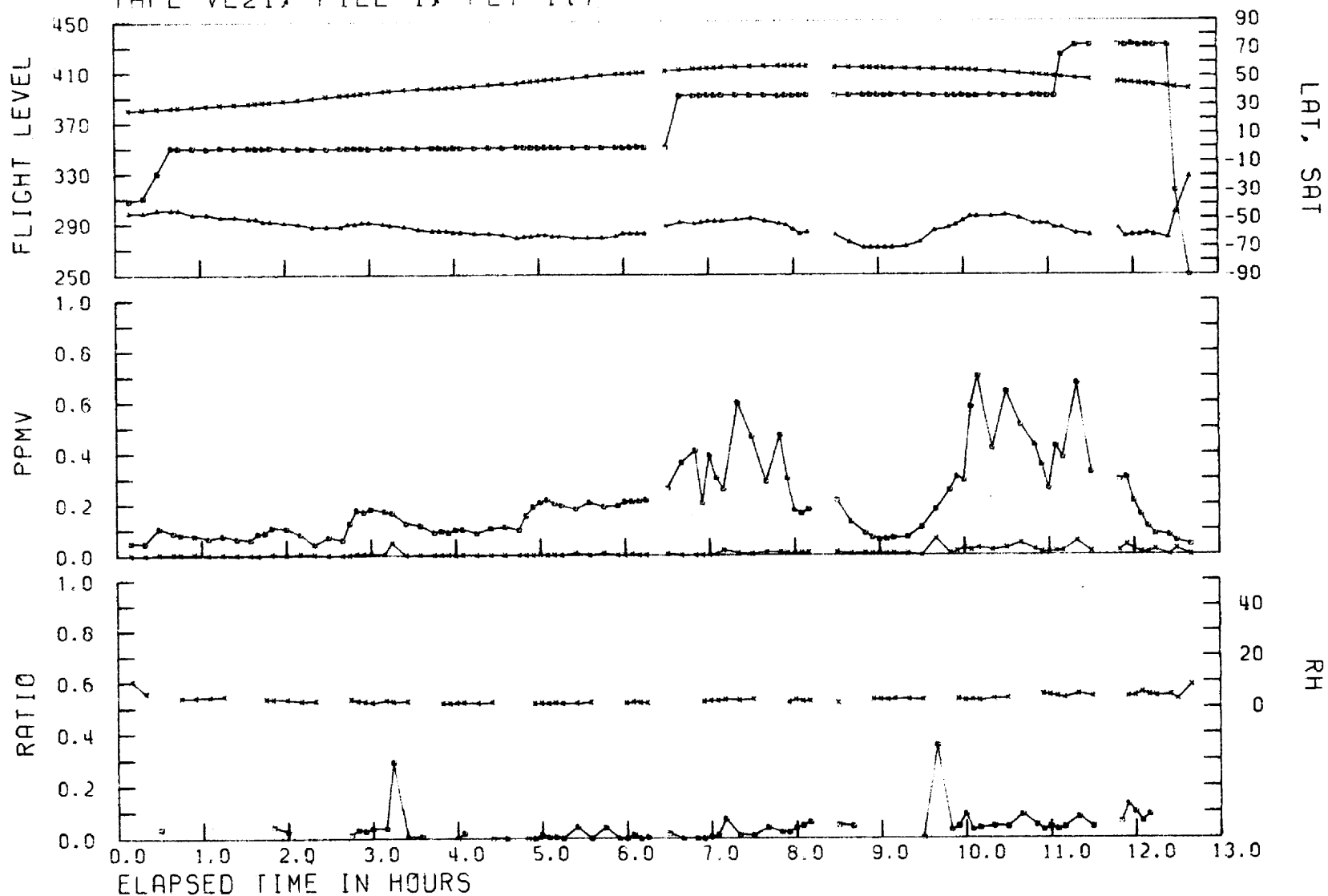


BOM TO BAH DEPARTURE 20 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 116

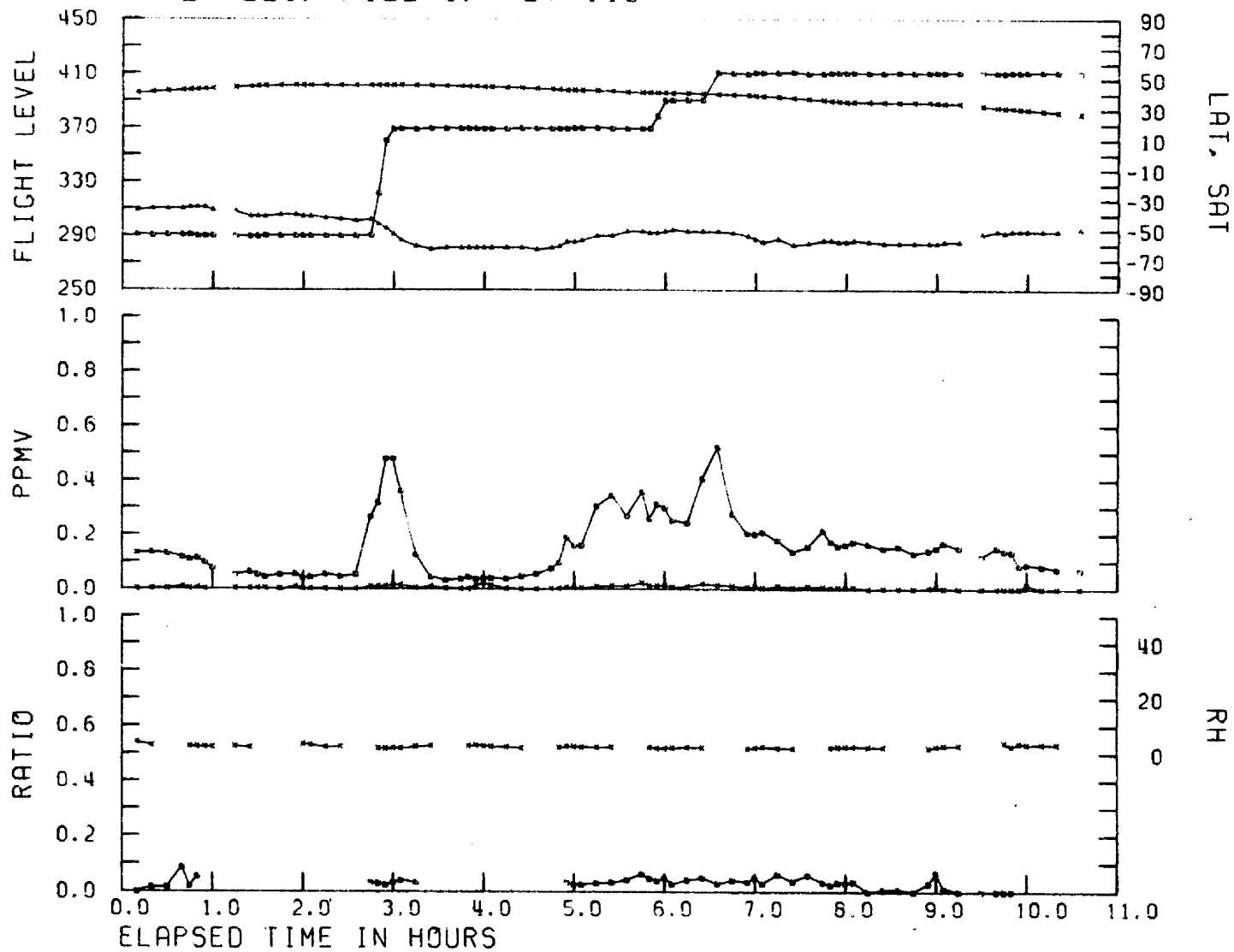


B-106

BAH TO JFK DEPARTURE 20 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 117



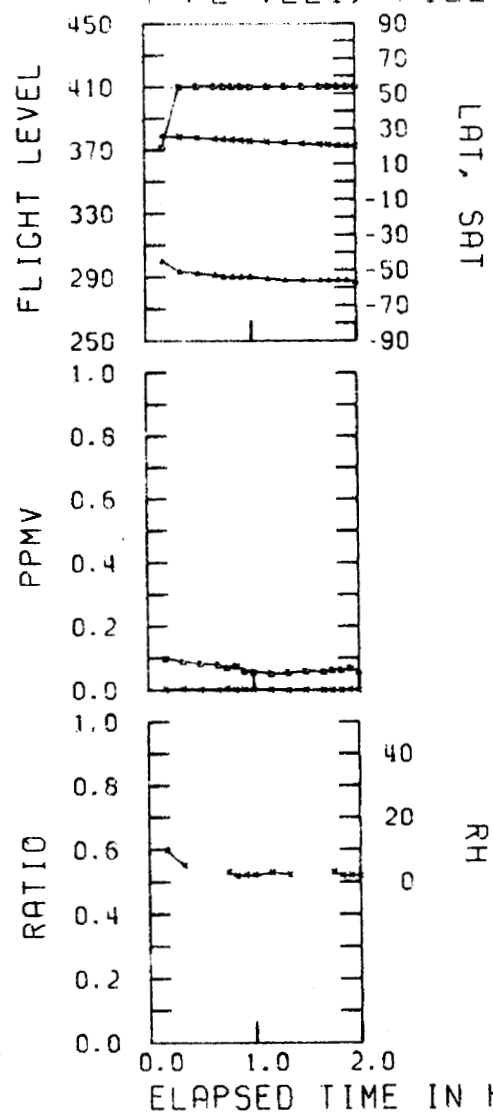
JFK TO BAH DEPARTURE 22 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 118



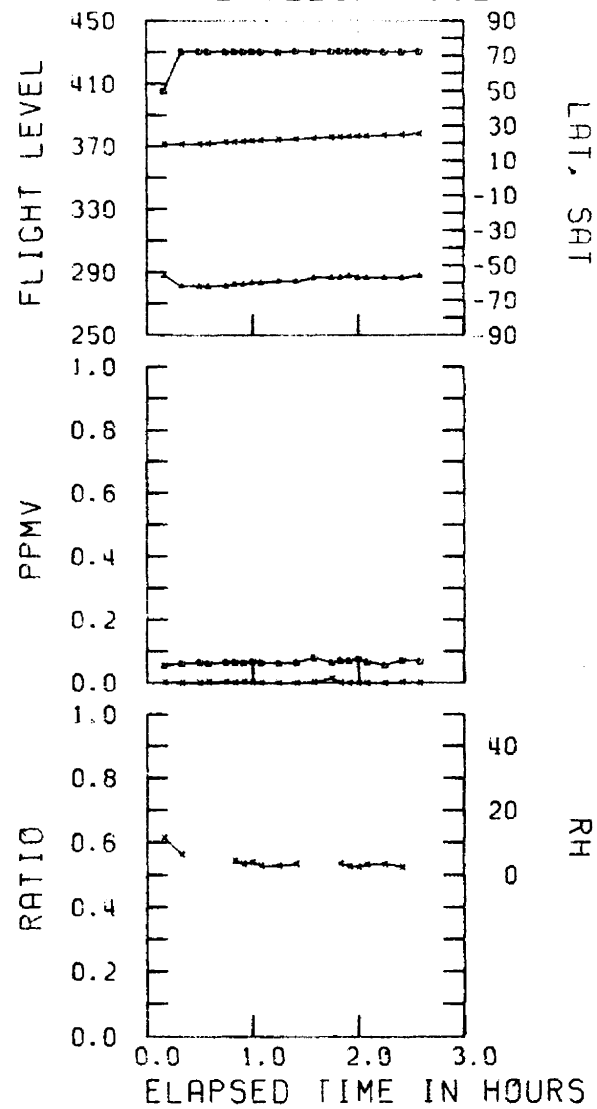
B-108

BAH TO BOM DEPARTURE 22 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 119

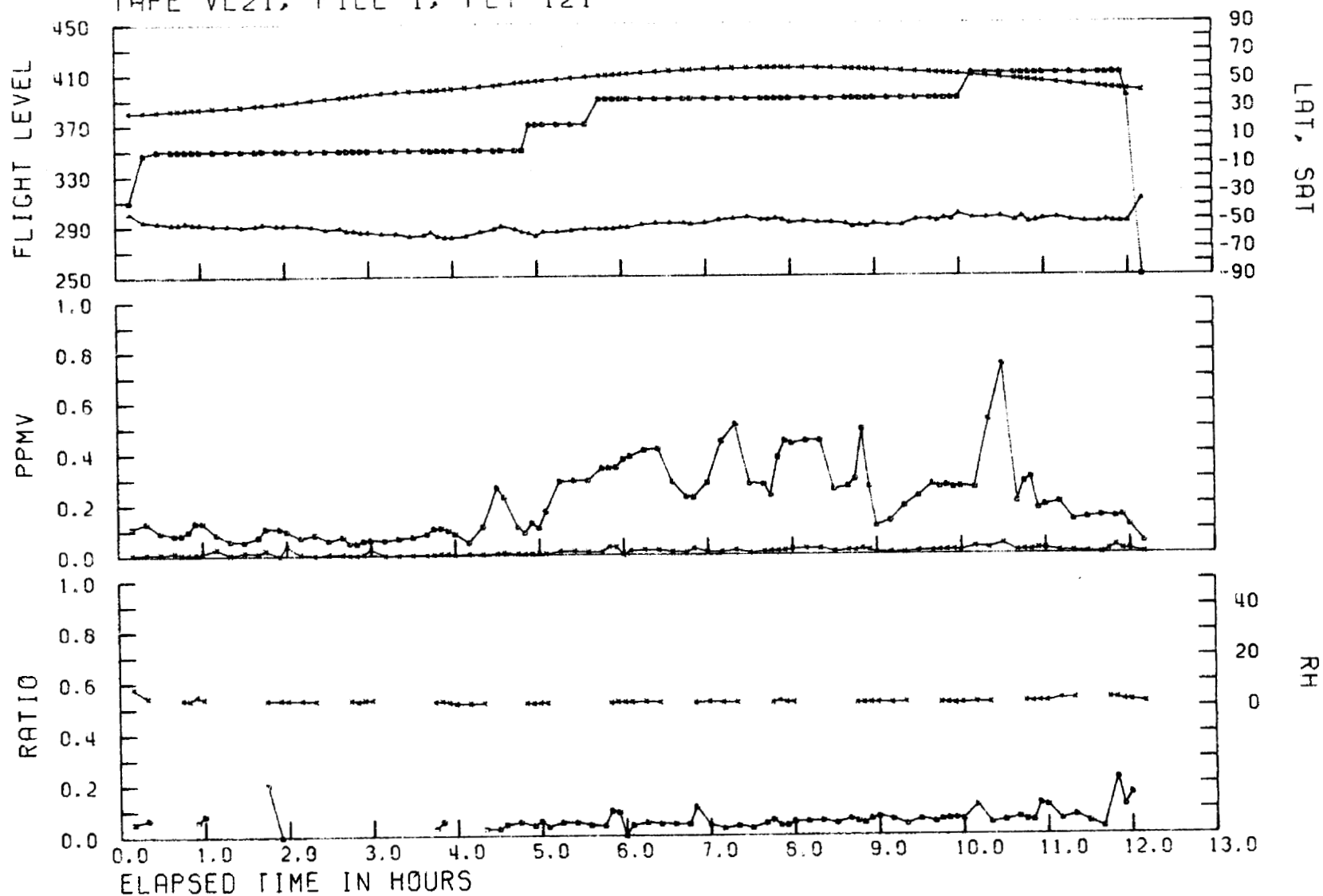
B-109



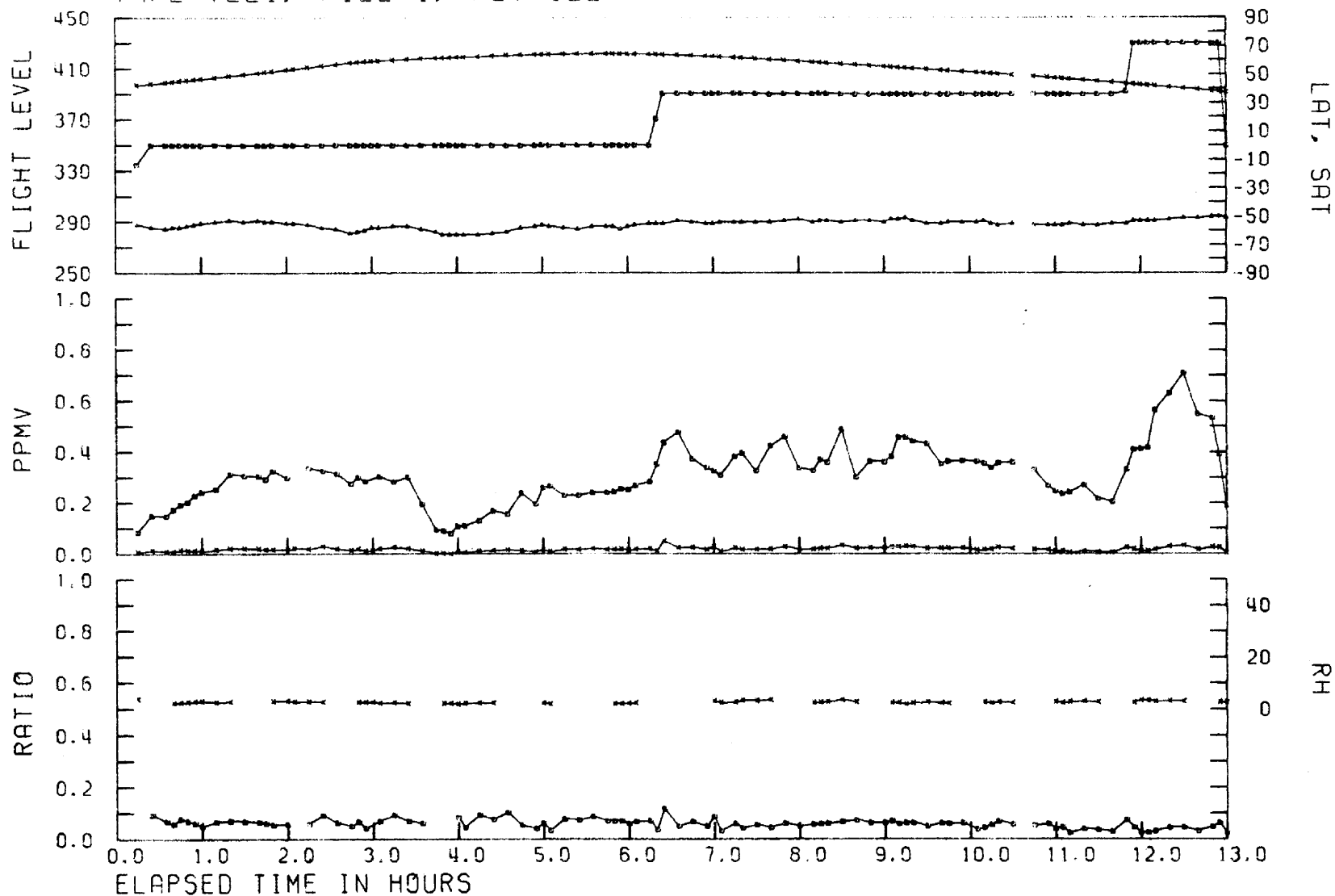
BOM TO BAH DEPARTURE 22 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 120



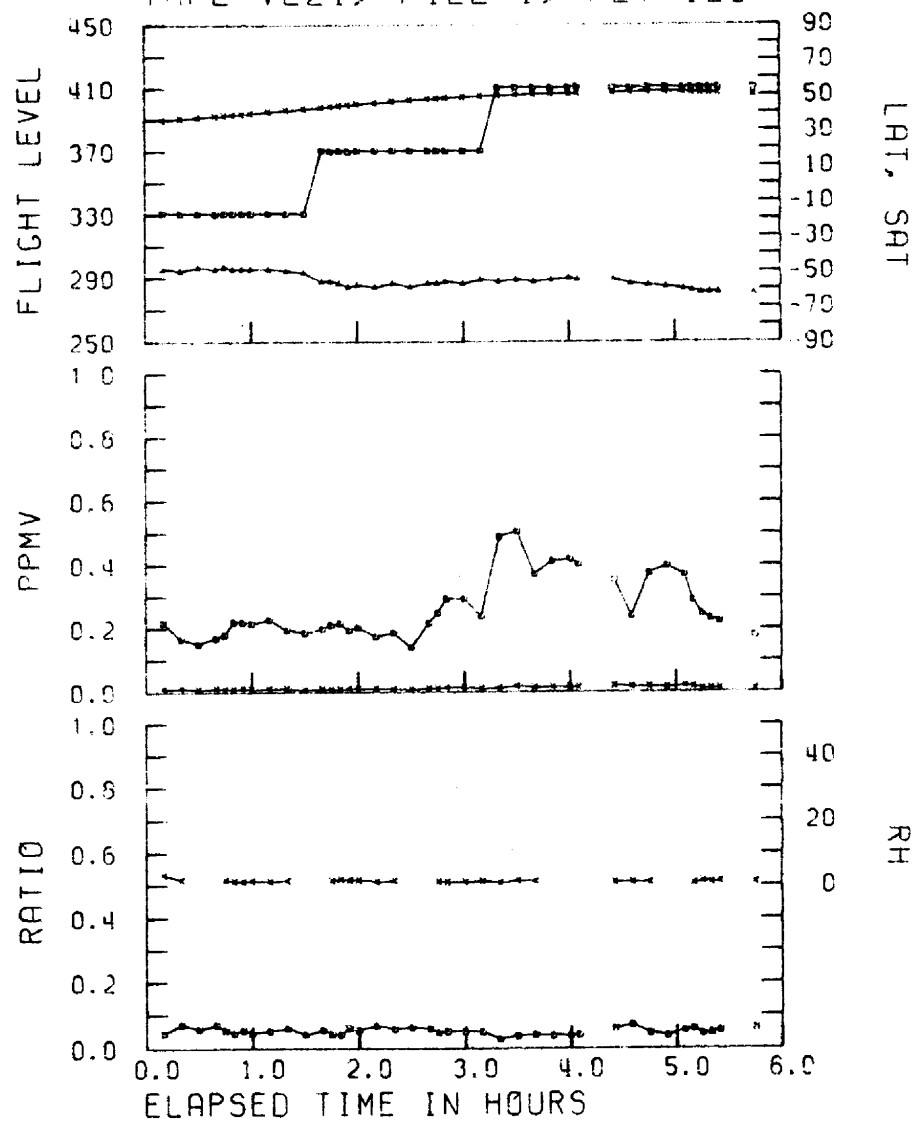
BAH TO JFK DEPARTURE 22 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 121



JFK TO NRT DEPARTURE 23 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 122

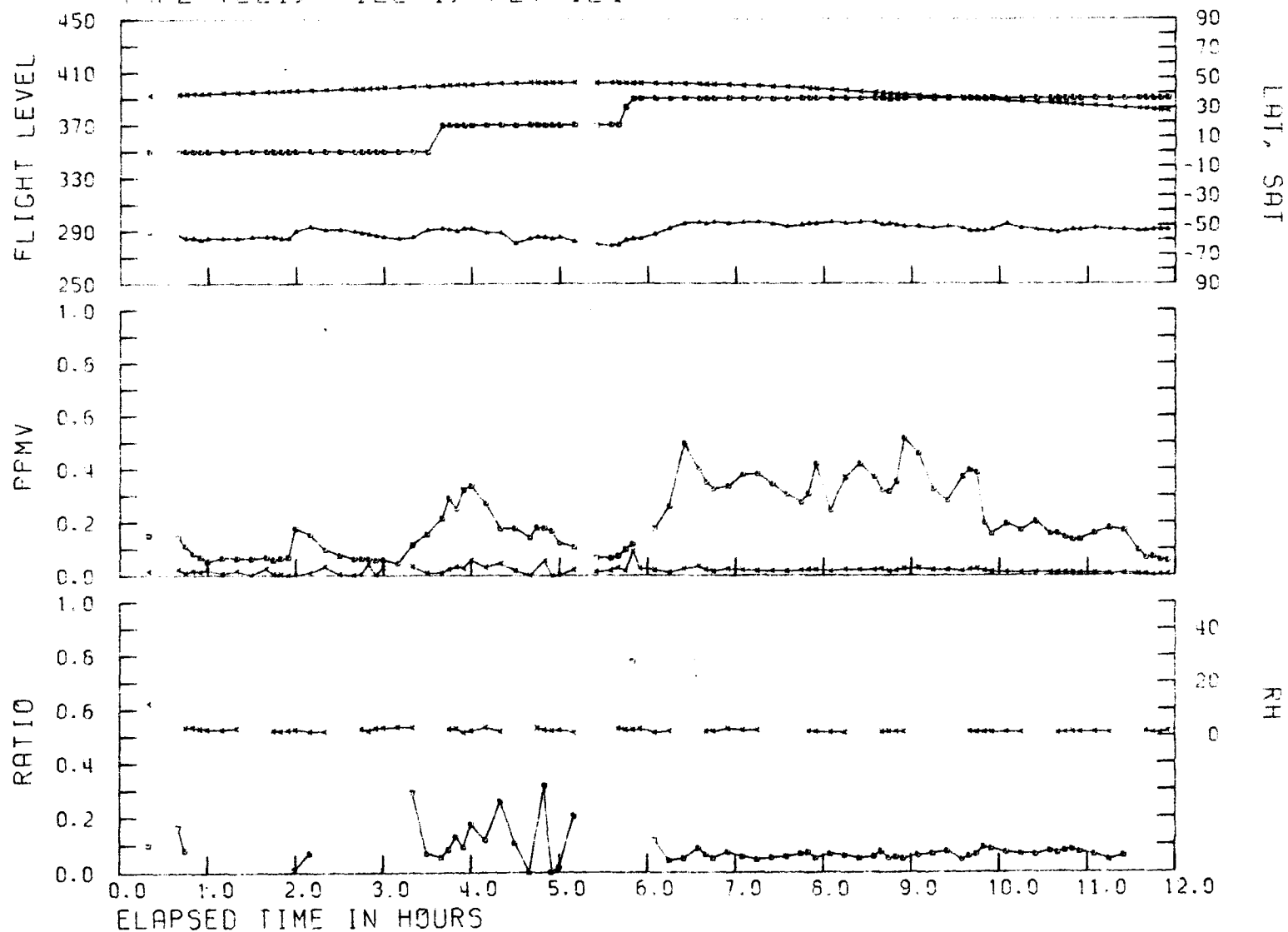


NRT TO SFO DEPARTURE 24 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 123



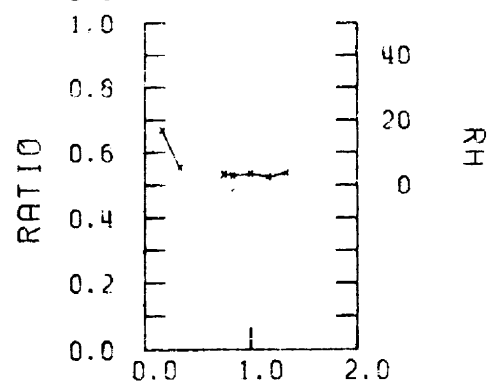
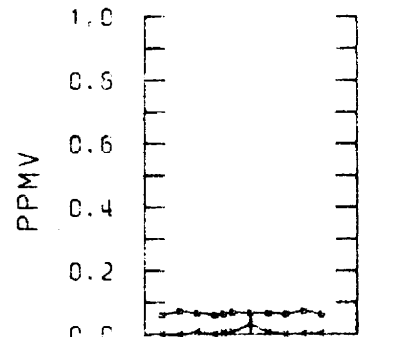
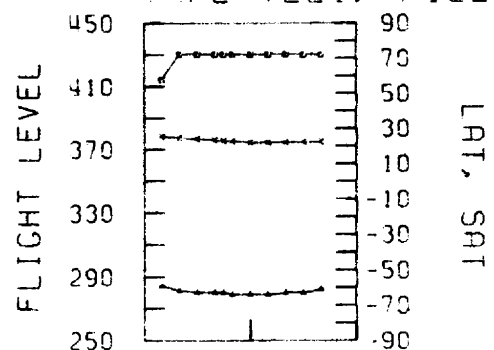
B-113

SFO TO OKA DEPARTURE 24 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 124



B-114

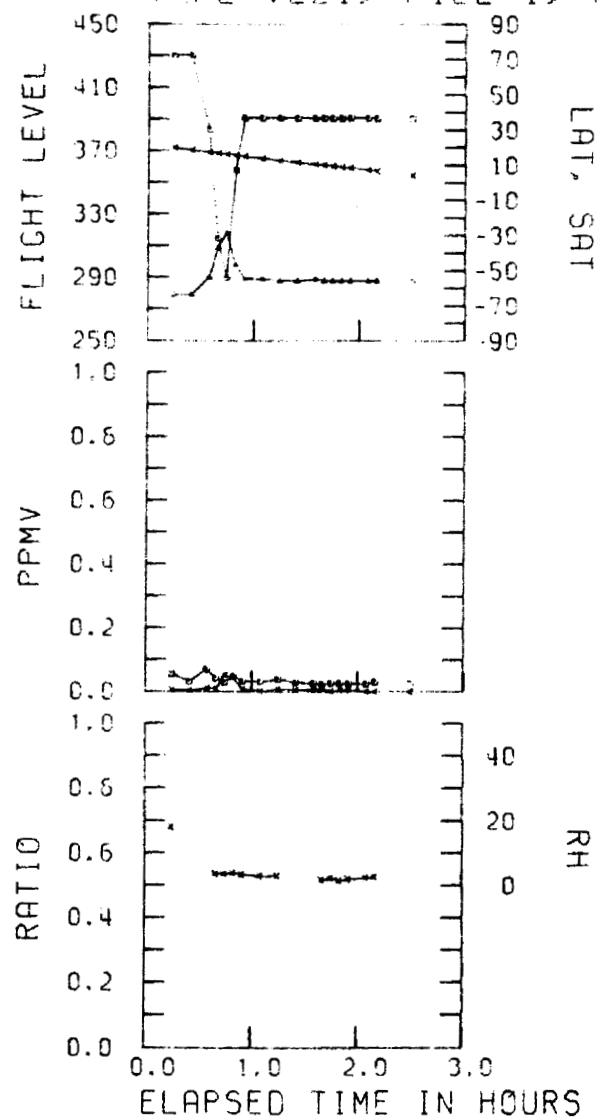
OKA TO HKG DEPARTURE 25 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 125



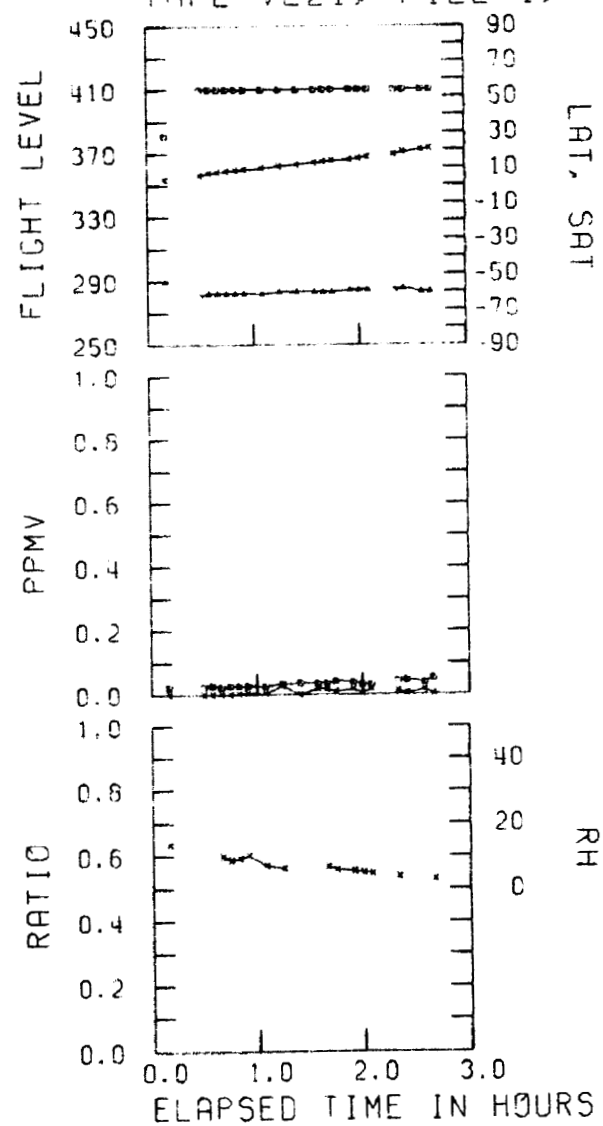
ELAPSED TIME IN HOURS

B-115

HKG TO SIN DEPARTURE 25 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 126



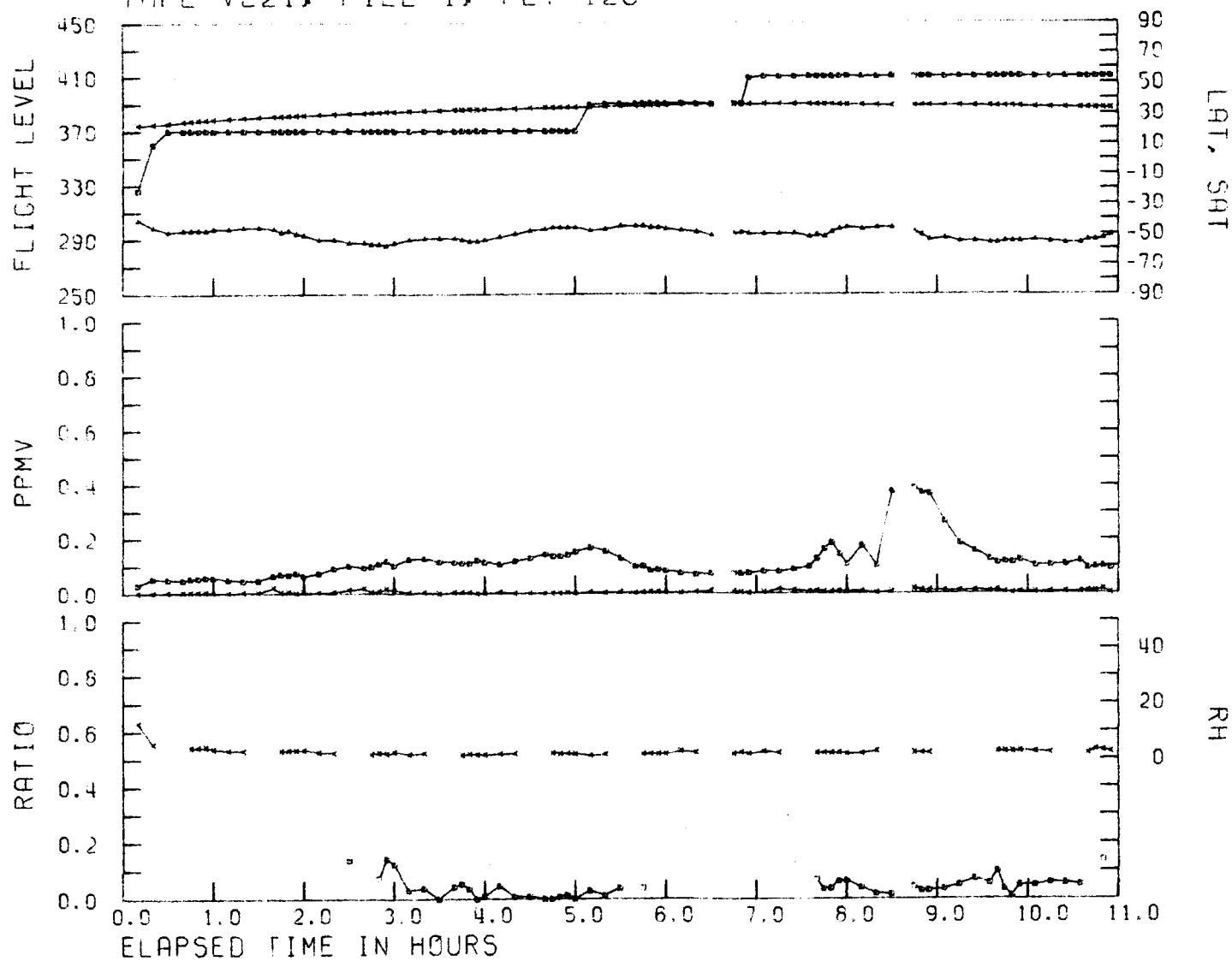
SIN TO HKG DEPARTURE 26 DEC 78 PANAM -N533PA
TAPE VL21, FILE 1, FLT 127



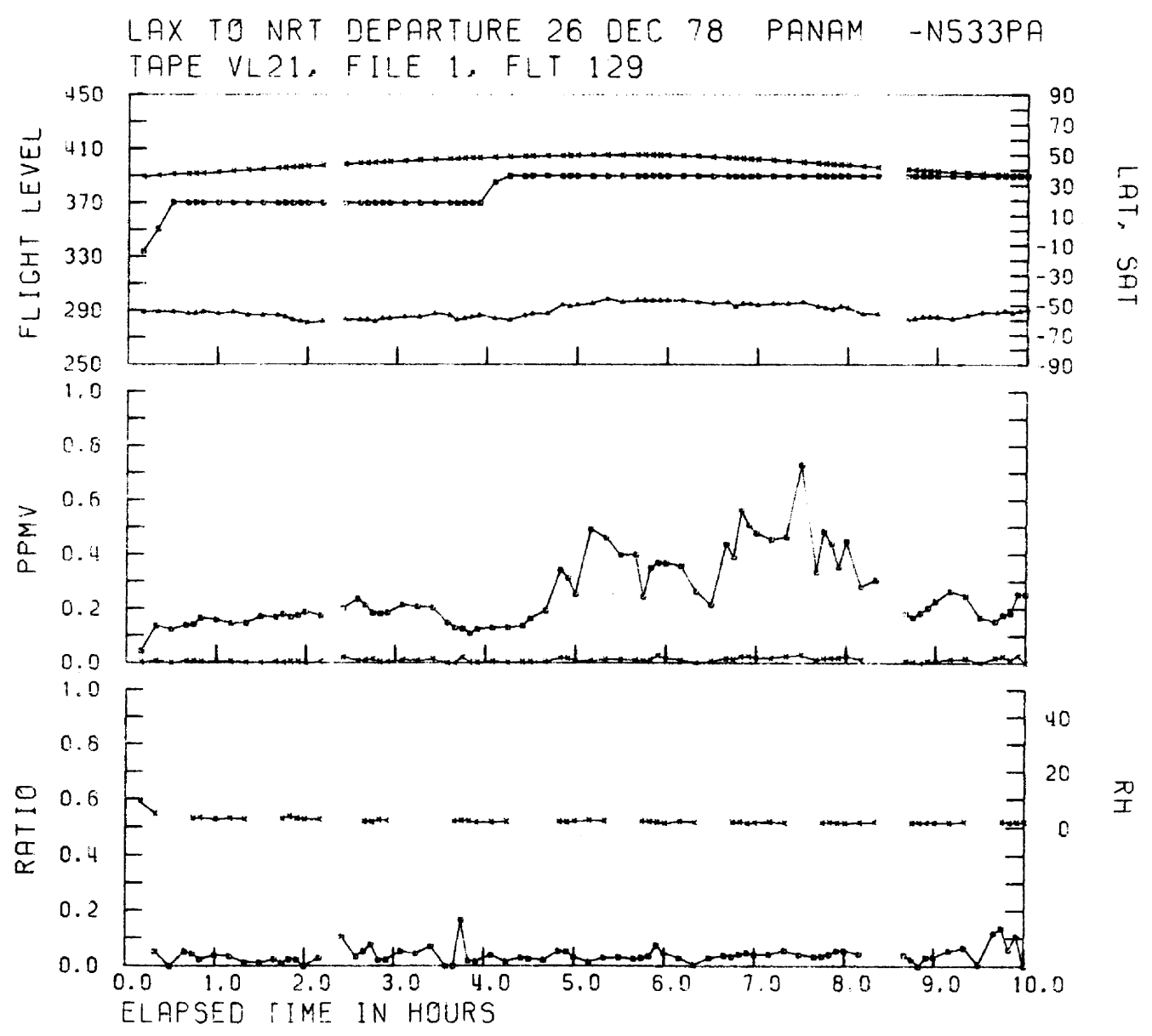
B-117

HKG TO LAX DEPARTURE 26 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 128

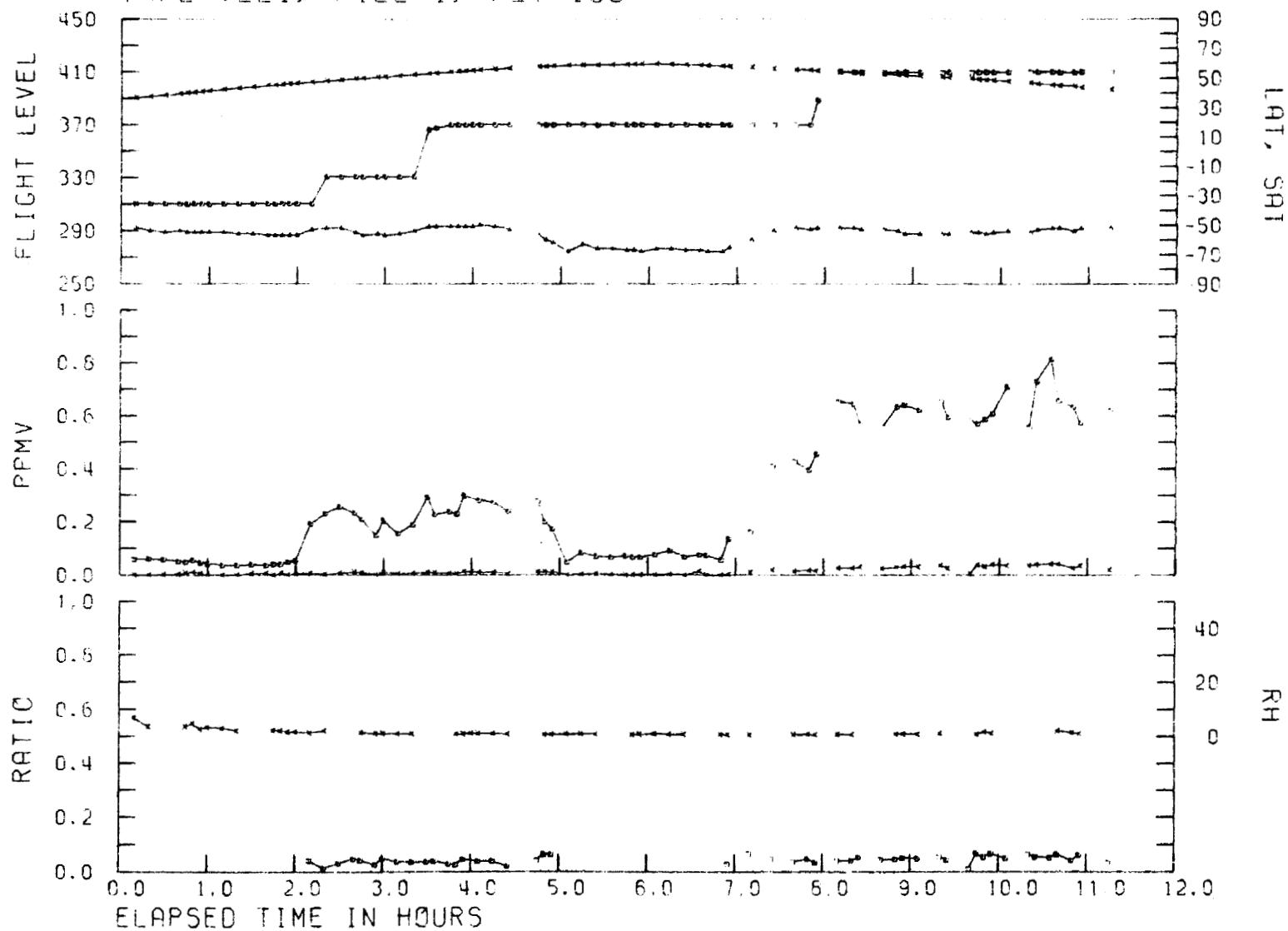
811-8



611-8

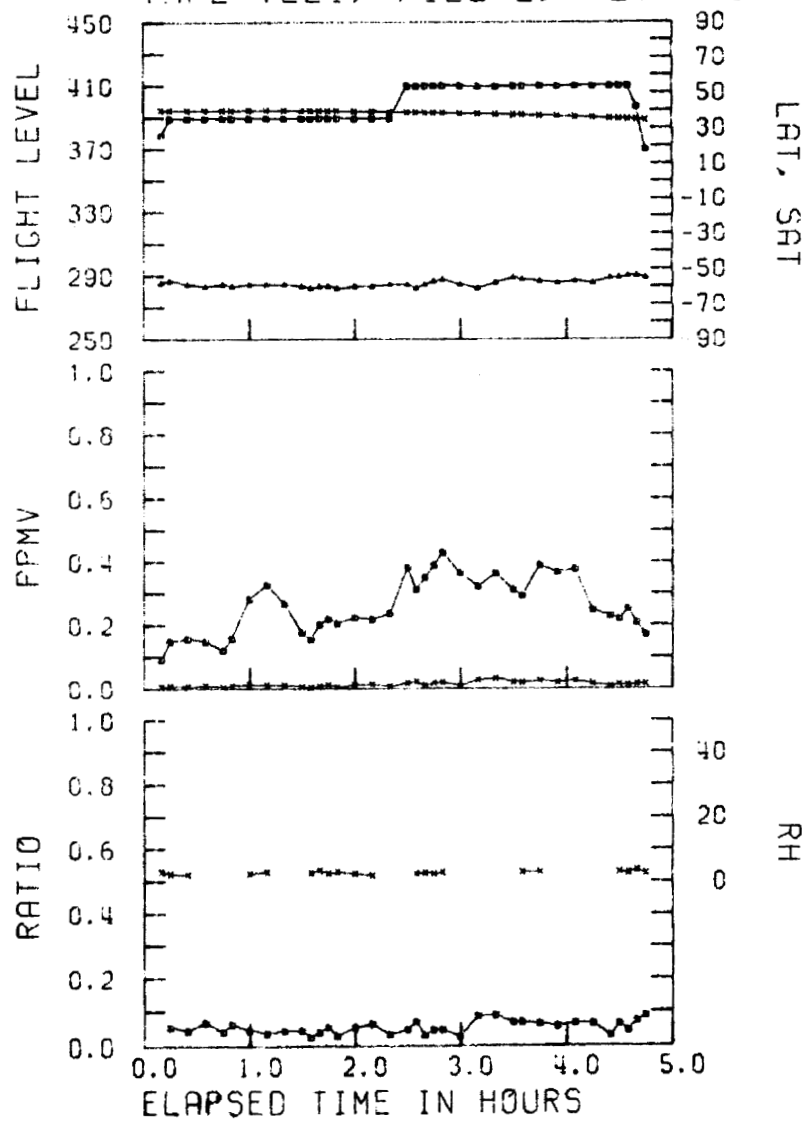


NRT TO JFK DEPARTURE 27 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 1, FLT 130



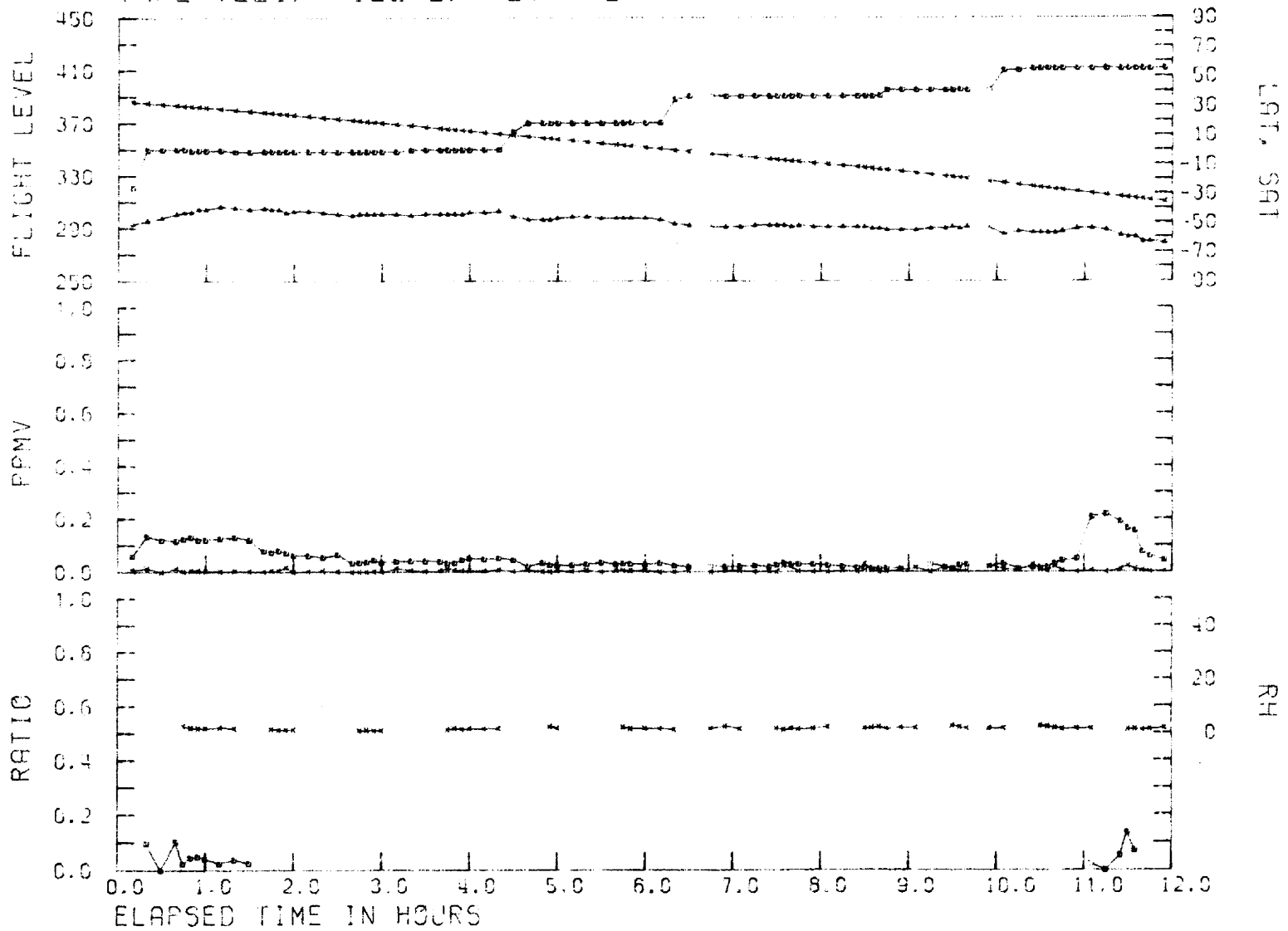
B-120

JFK TO LAX DEPARTURE 28 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 1



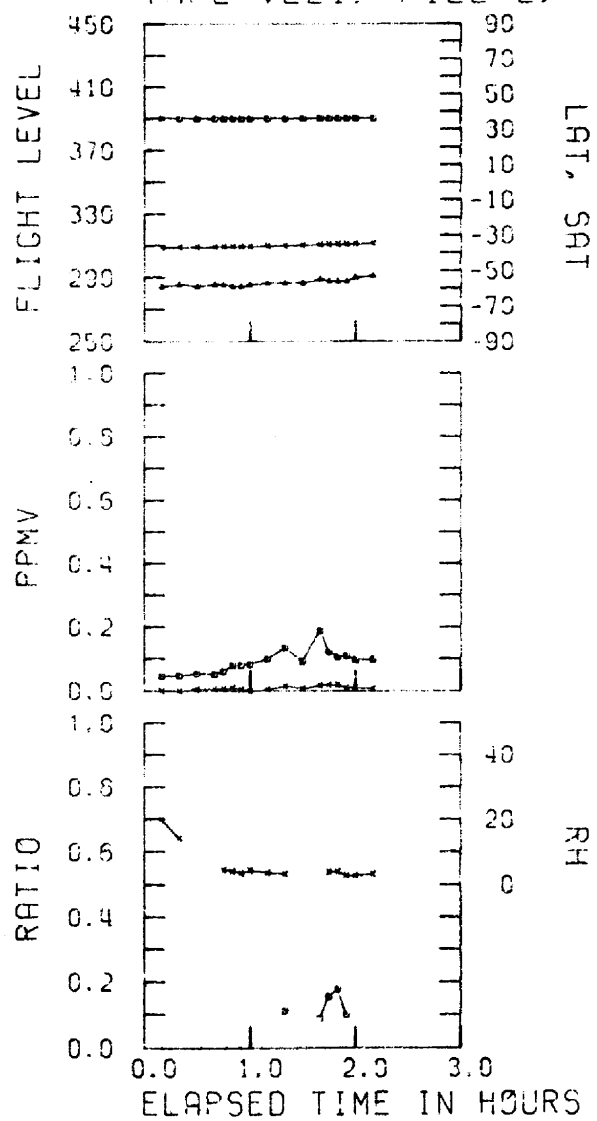
B-121

LAX TO AKL DEPARTURE 29 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 2



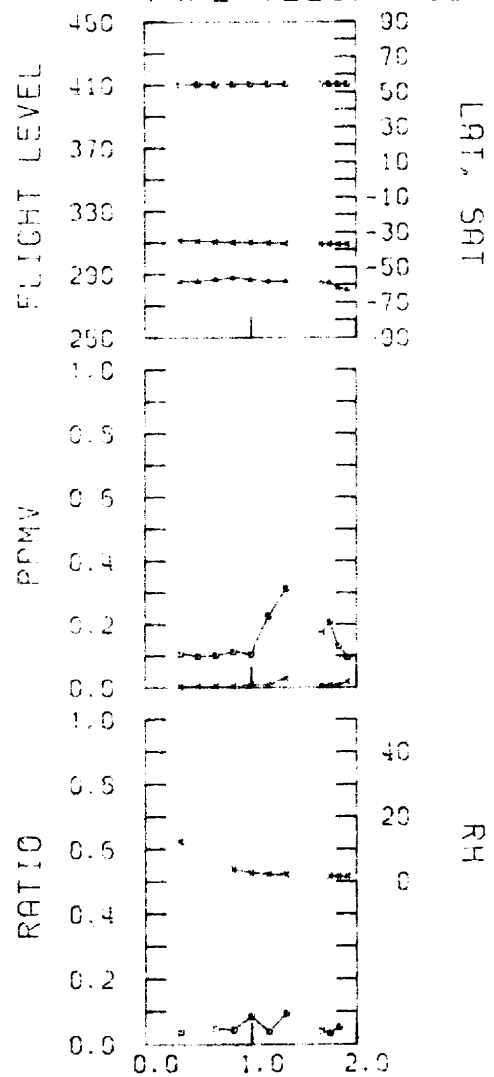
B-122

AKL TO SYD DEPARTURE 29 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 3



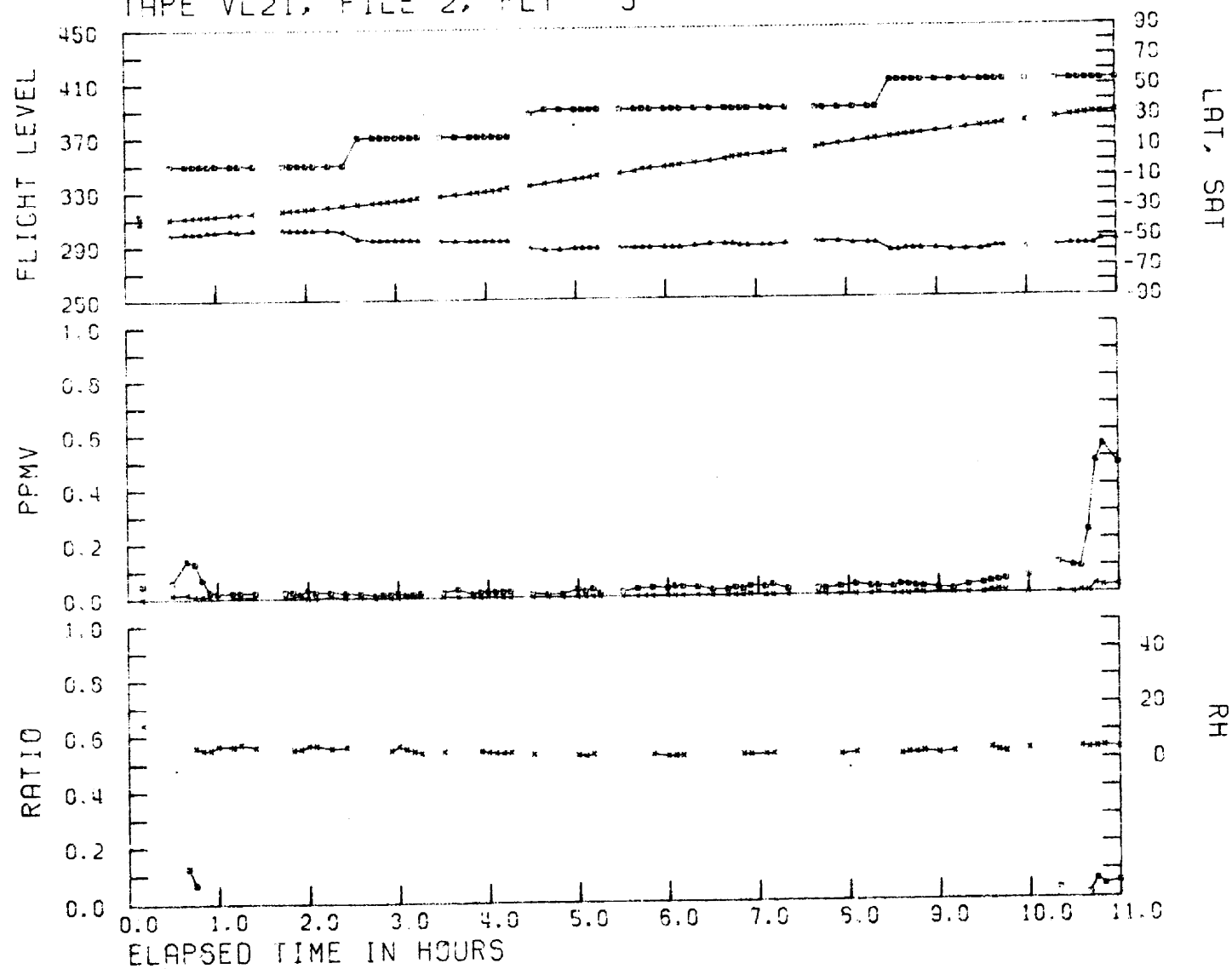
B-123

SYD TO AKL DEPARTURE 30 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 4



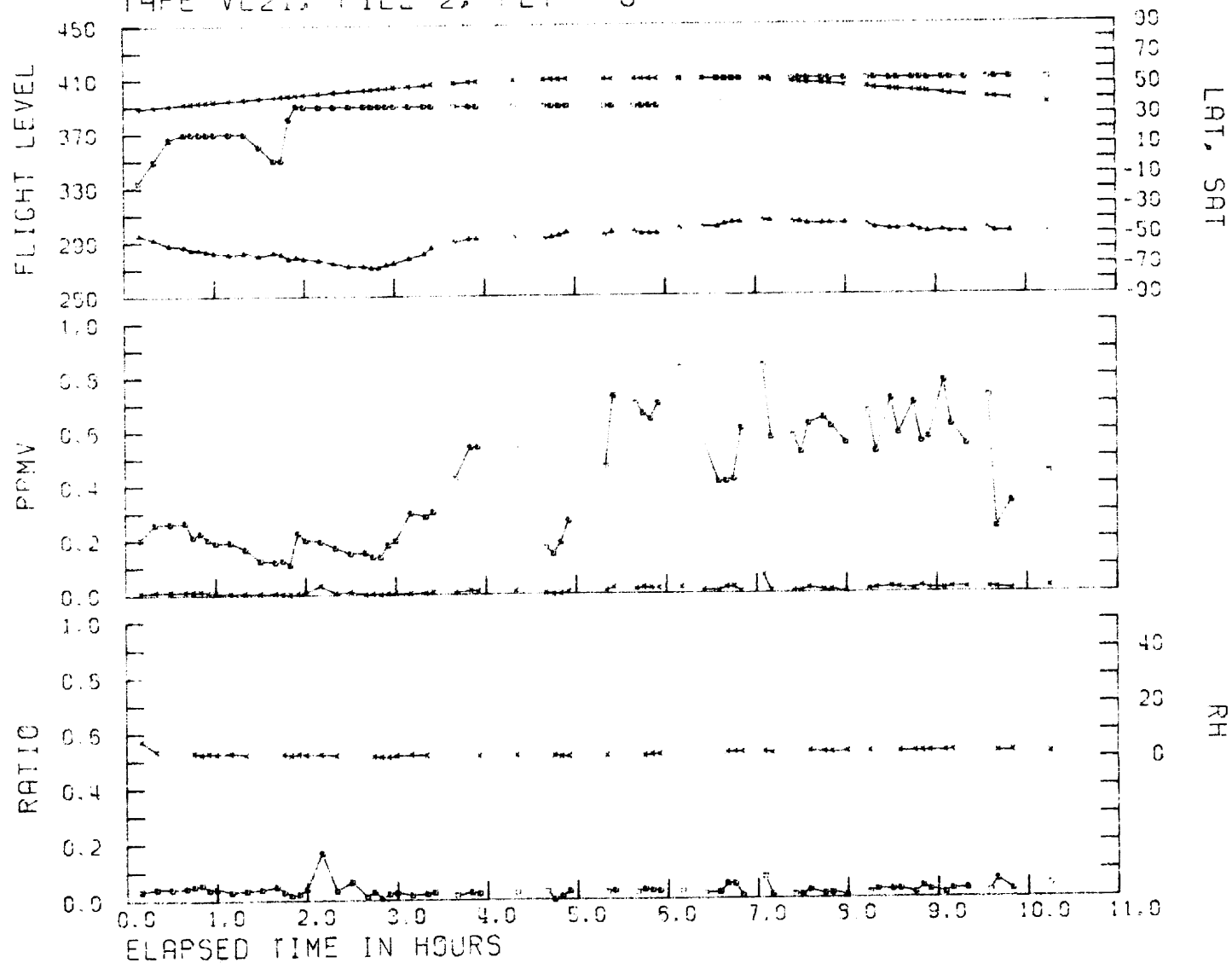
B-124

AKL TO LAX DEPARTURE 30 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 5



B-125

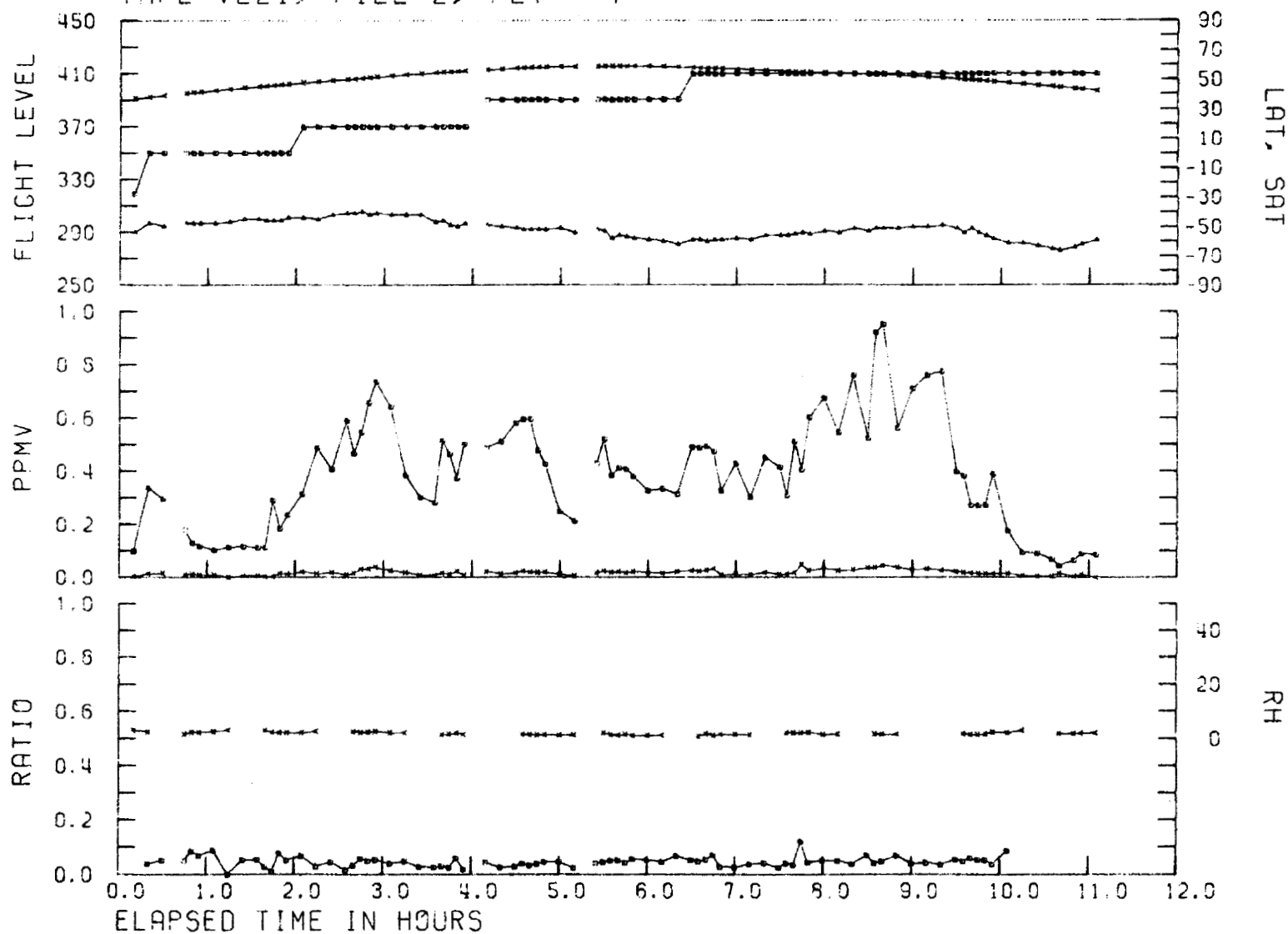
LAX TO NRT DEPARTURE 30 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 6



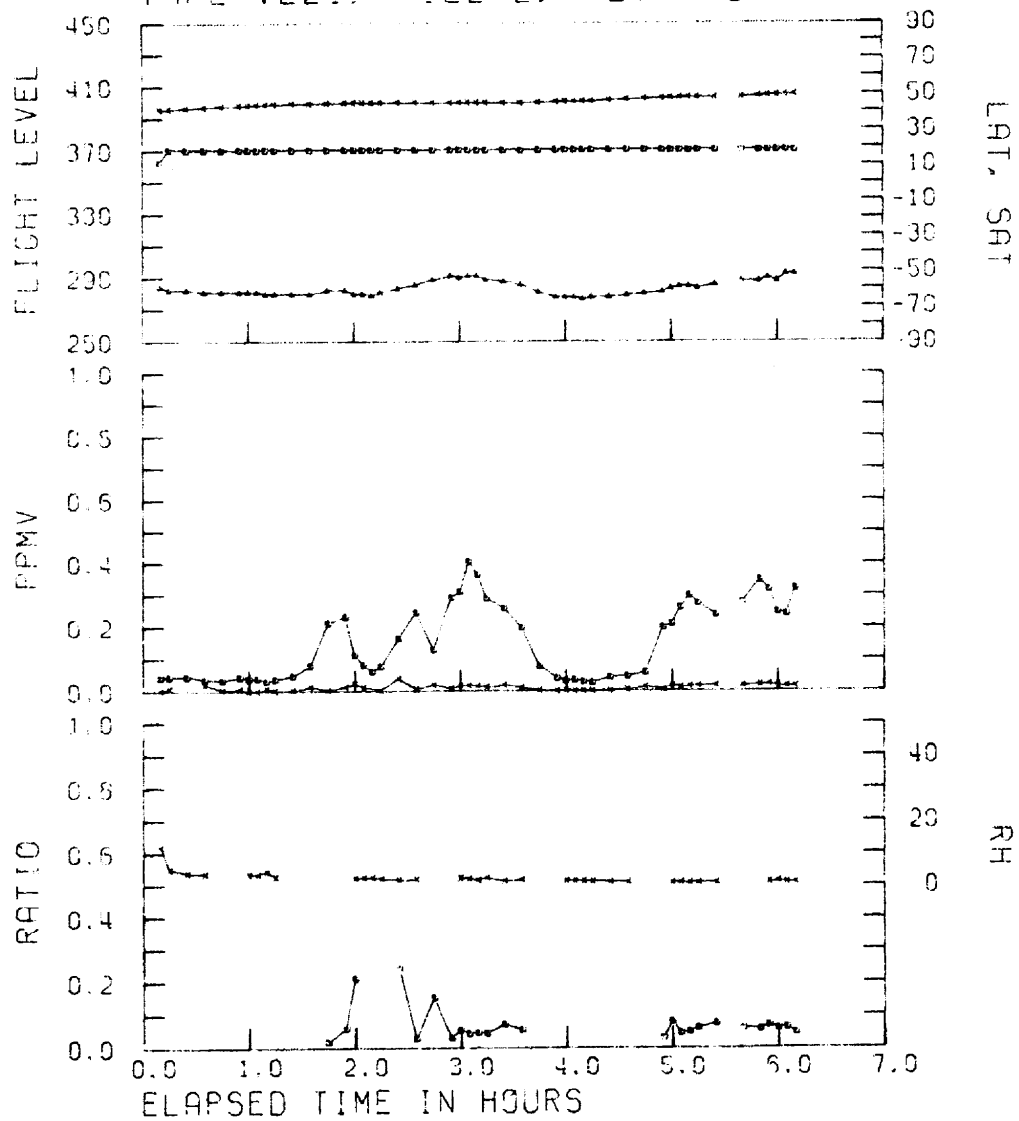
B-126

NRT TO JFK DEPARTURE 31 DEC 78 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 7

B-127

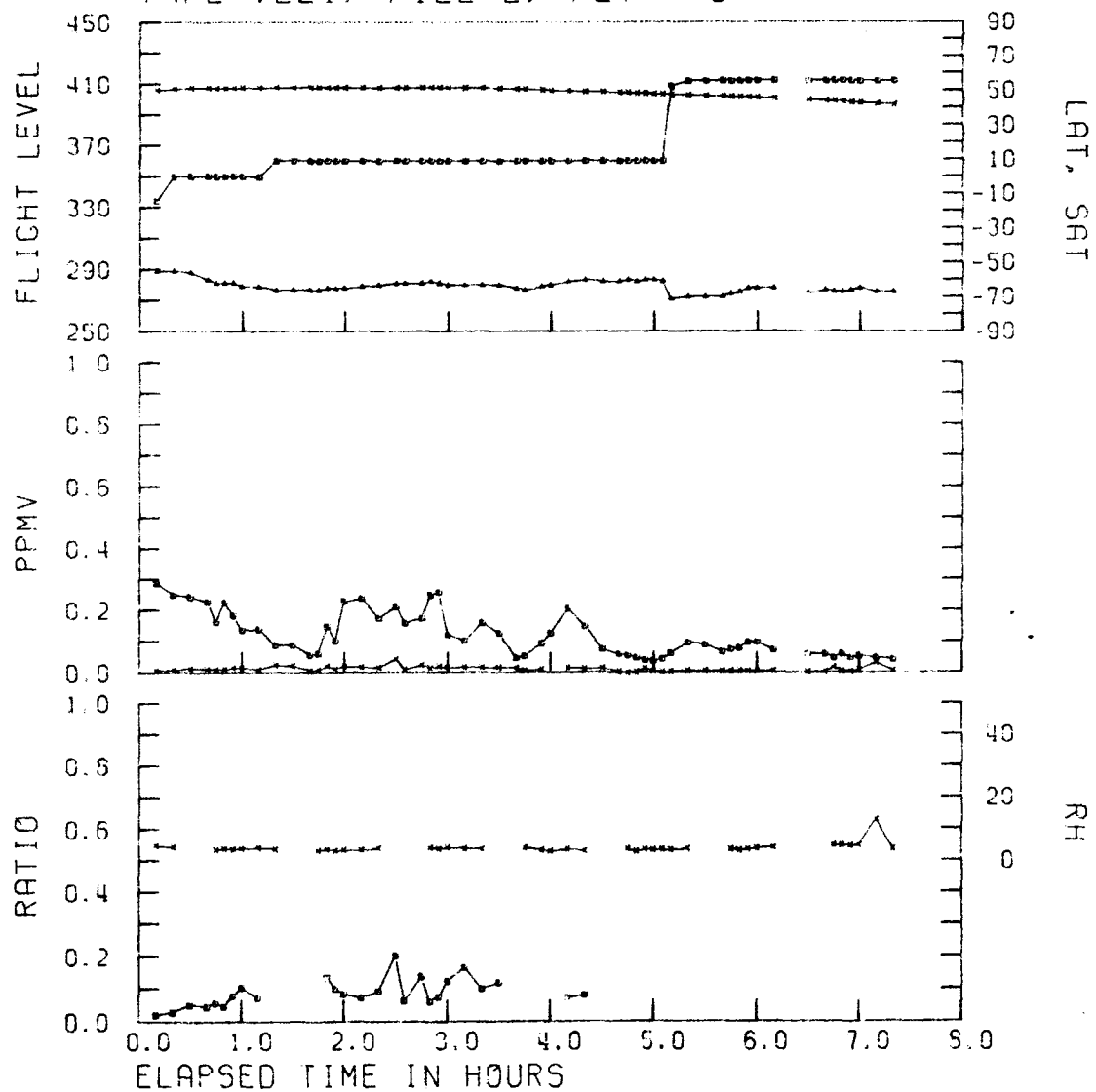


JFK TO FRA DEPARTURE 1 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 8



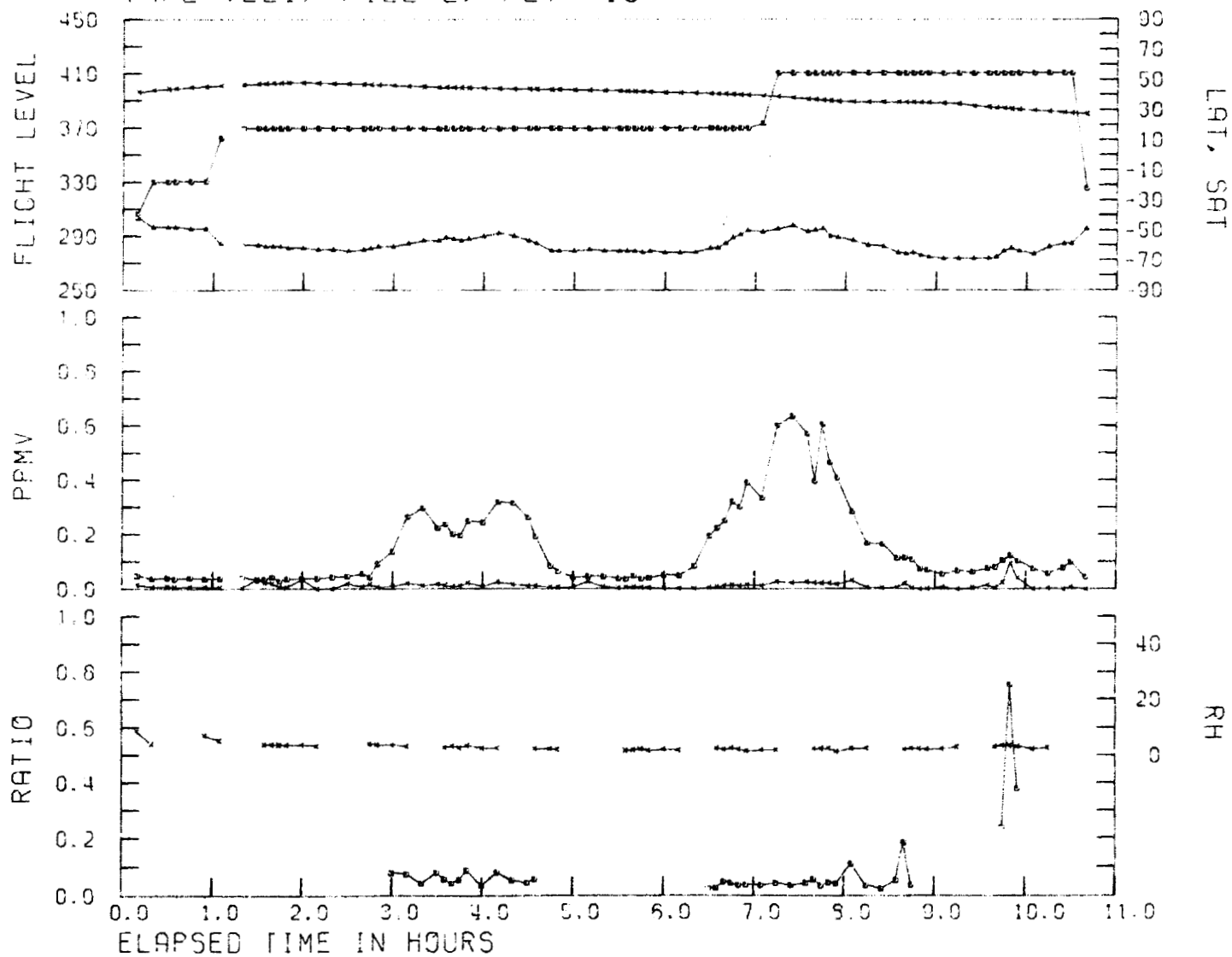
B-128

FRA TO JFK DEPARTURE 2 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 9

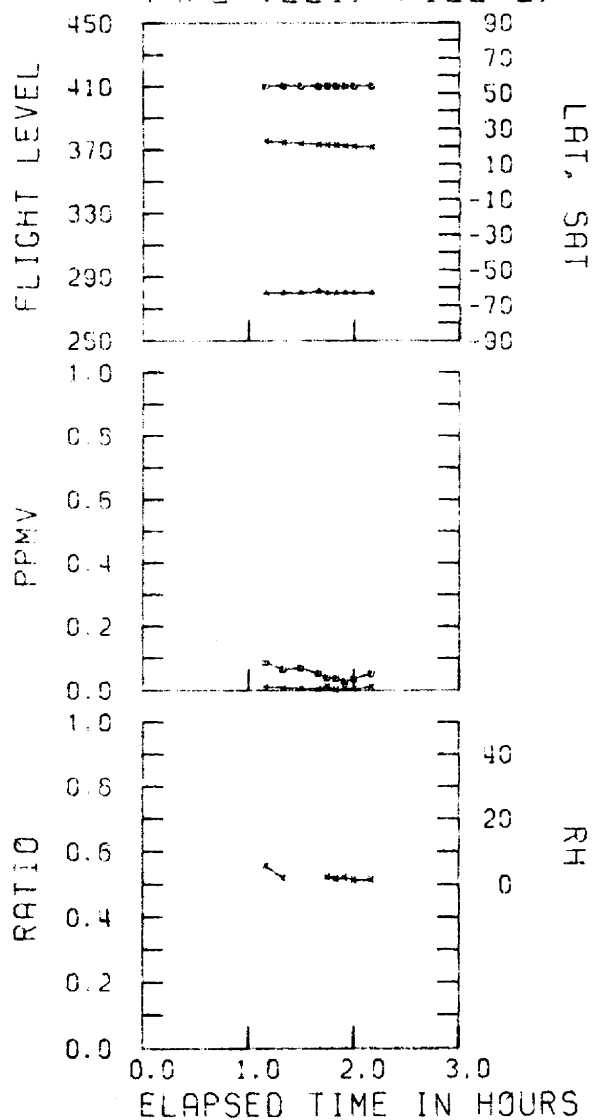


B-129

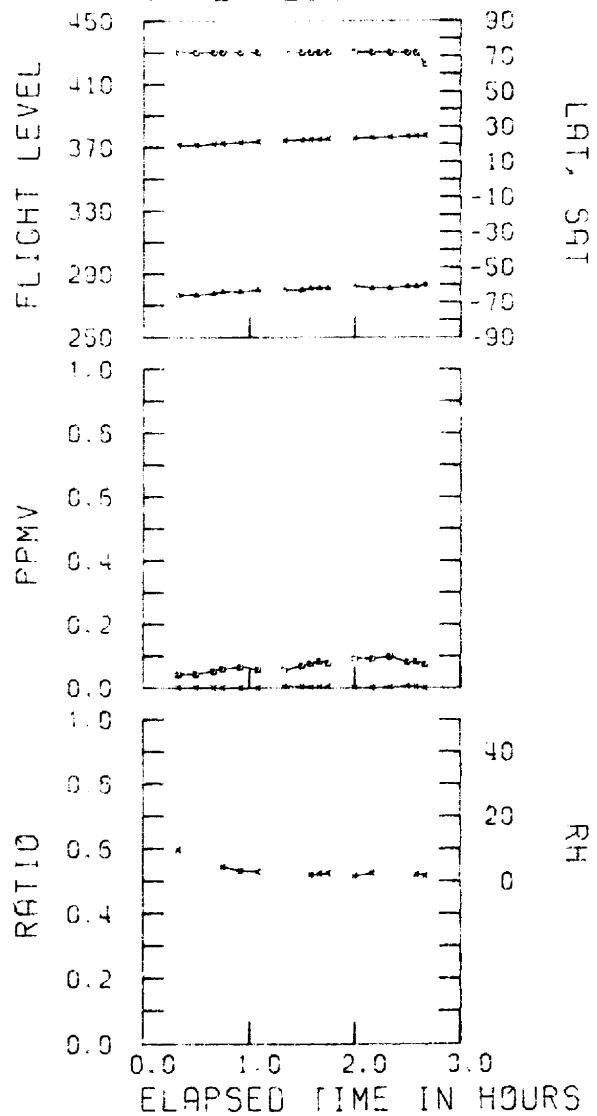
JFK TO BAH DEPARTURE 2 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 10



BAH TO BOM DEPARTURE 3 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 11

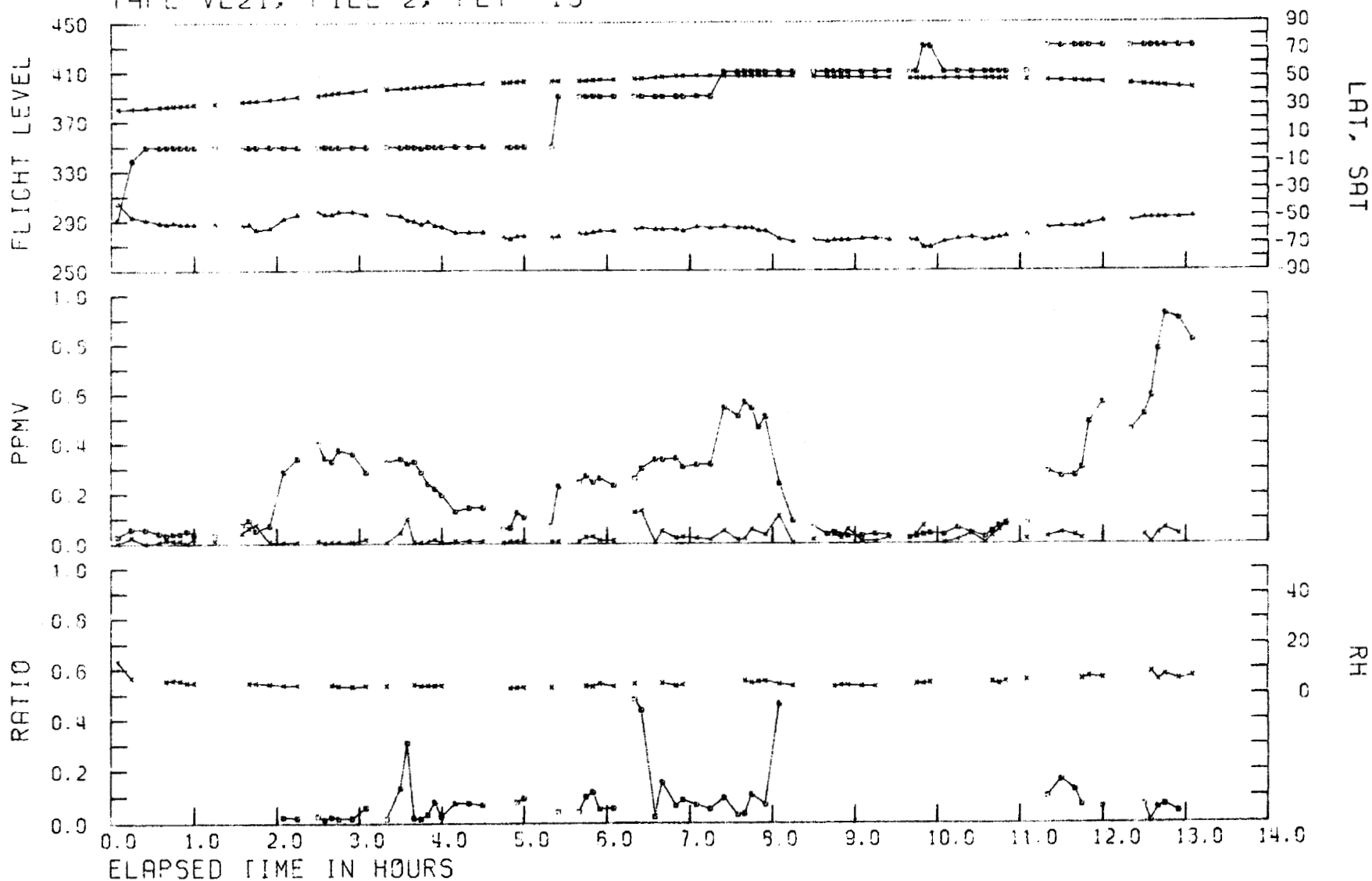


BOM TO BAH DEPARTURE 3 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 12

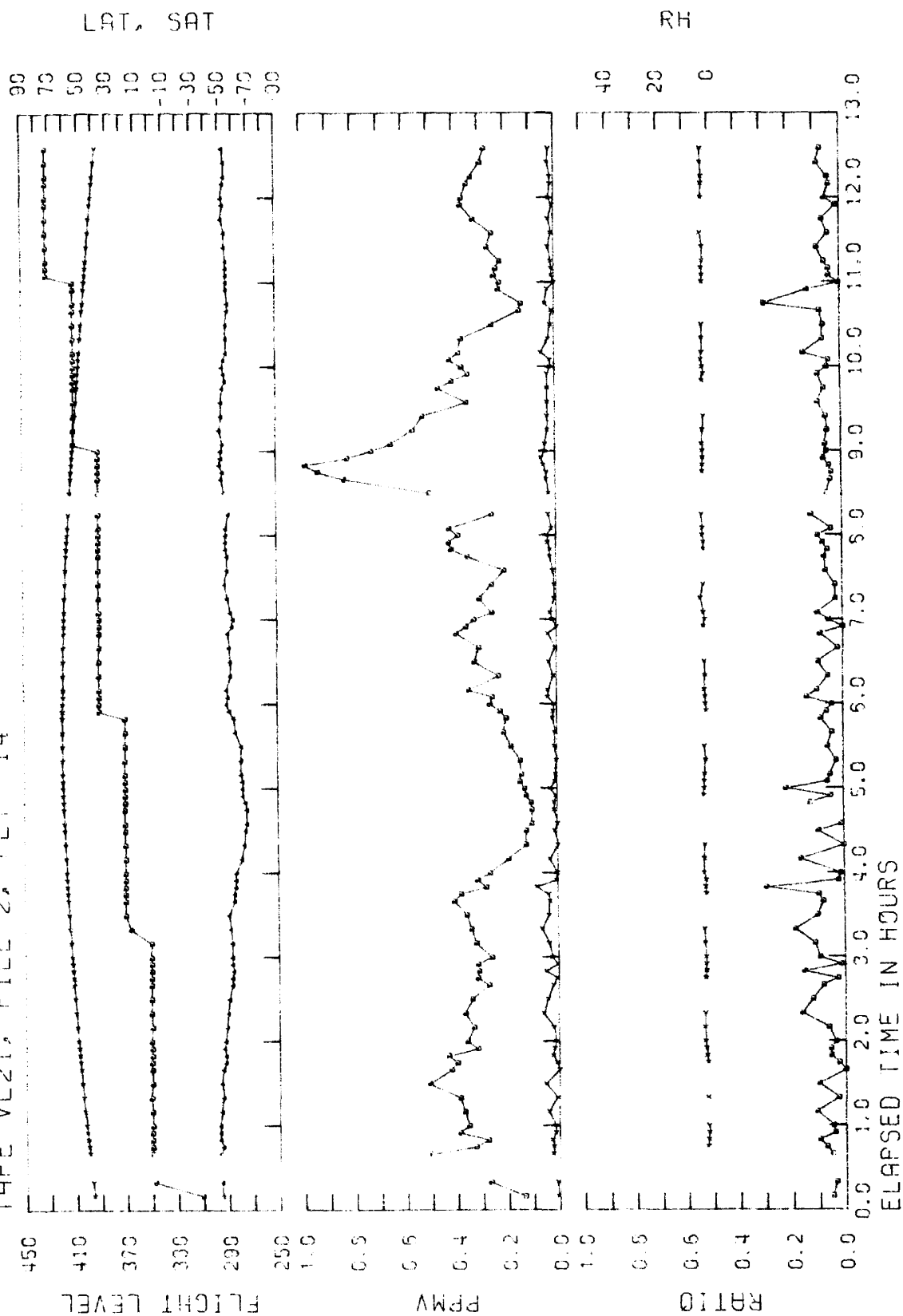


B-132

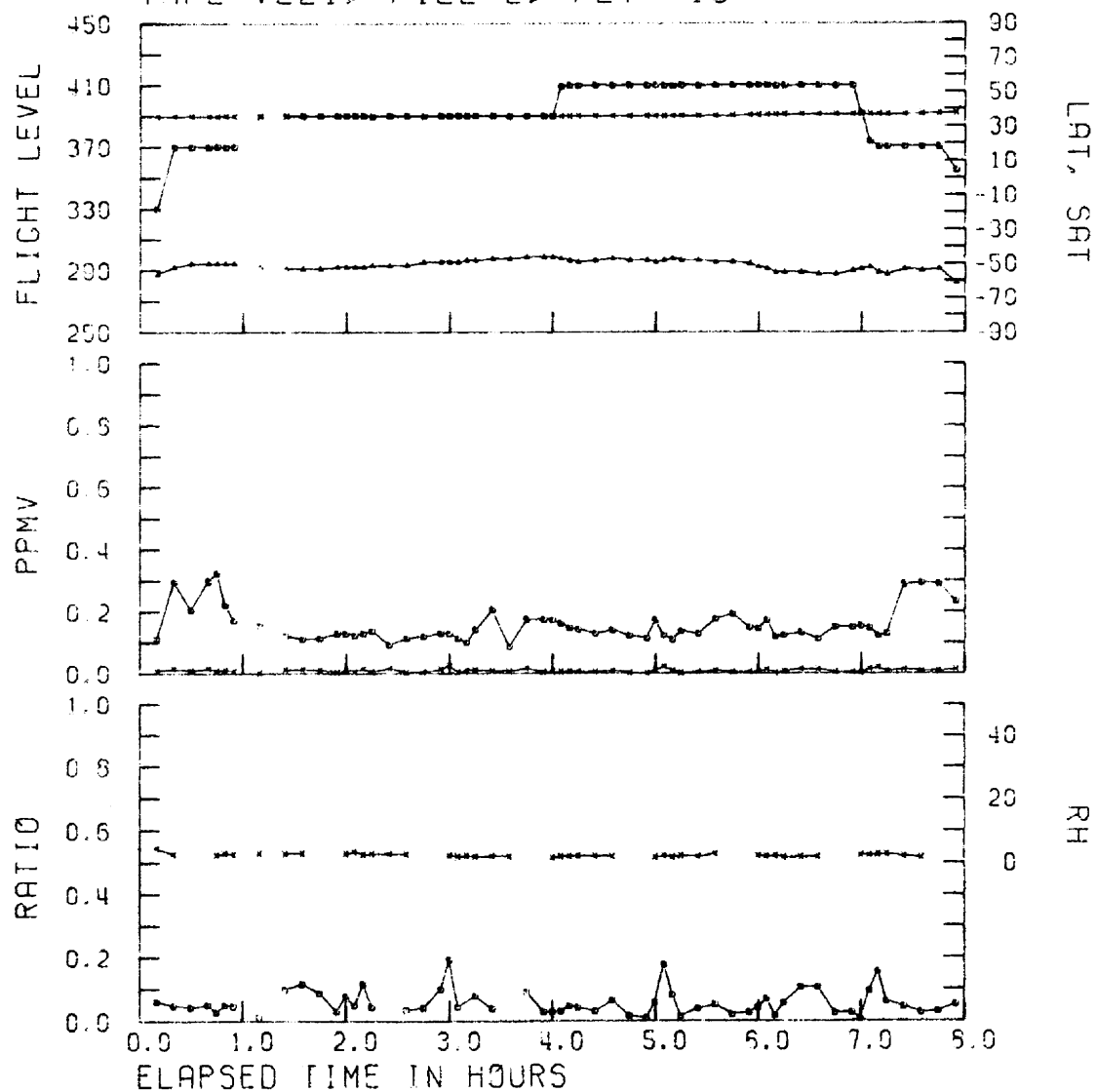
BAH TO JFK DEPARTURE 3 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 13



JFK TO NRT DEPARTURE 4 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 14

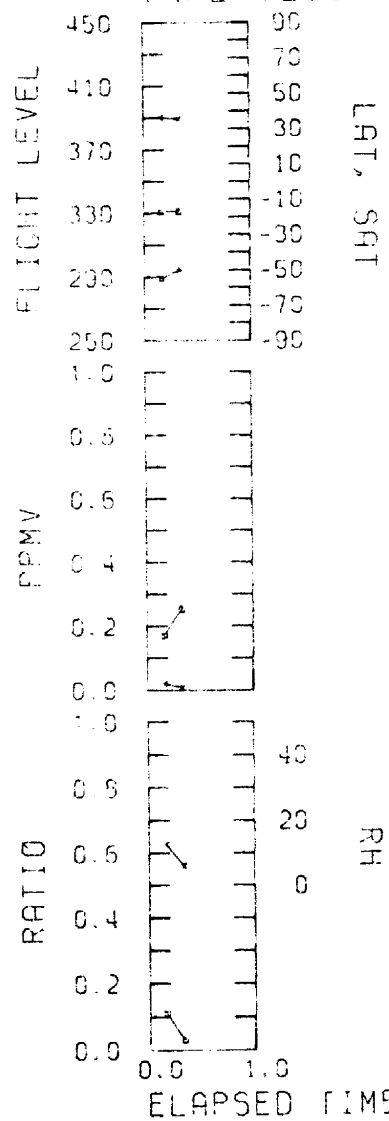


NRT TO SFO DEPARTURE 5 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 15



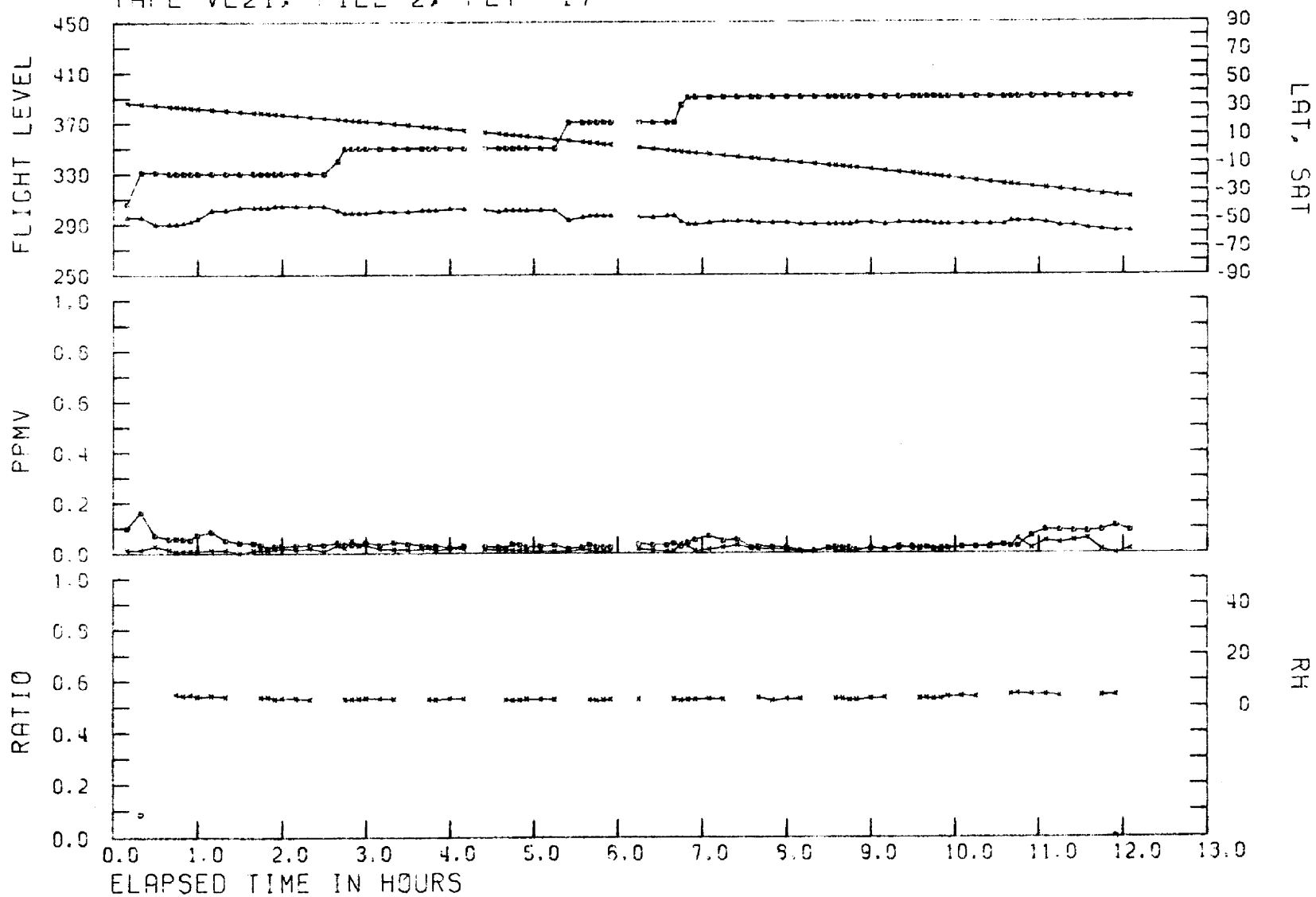
B-135

SFO TO LAX DEPARTURE 5 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 16



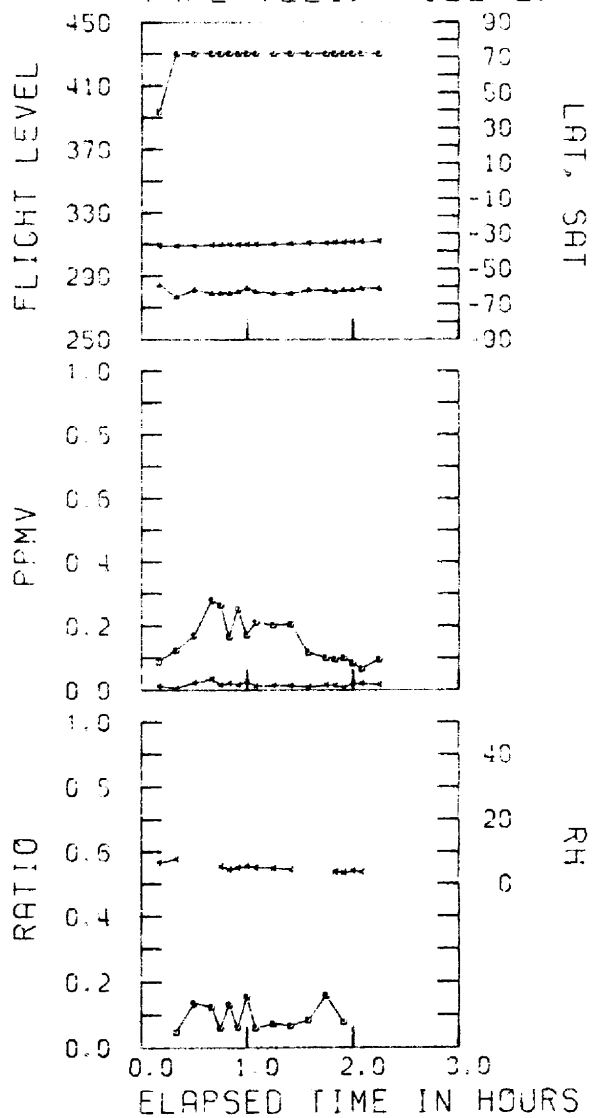
B-136

LAX TO AKL DEPARTURE 6 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 17



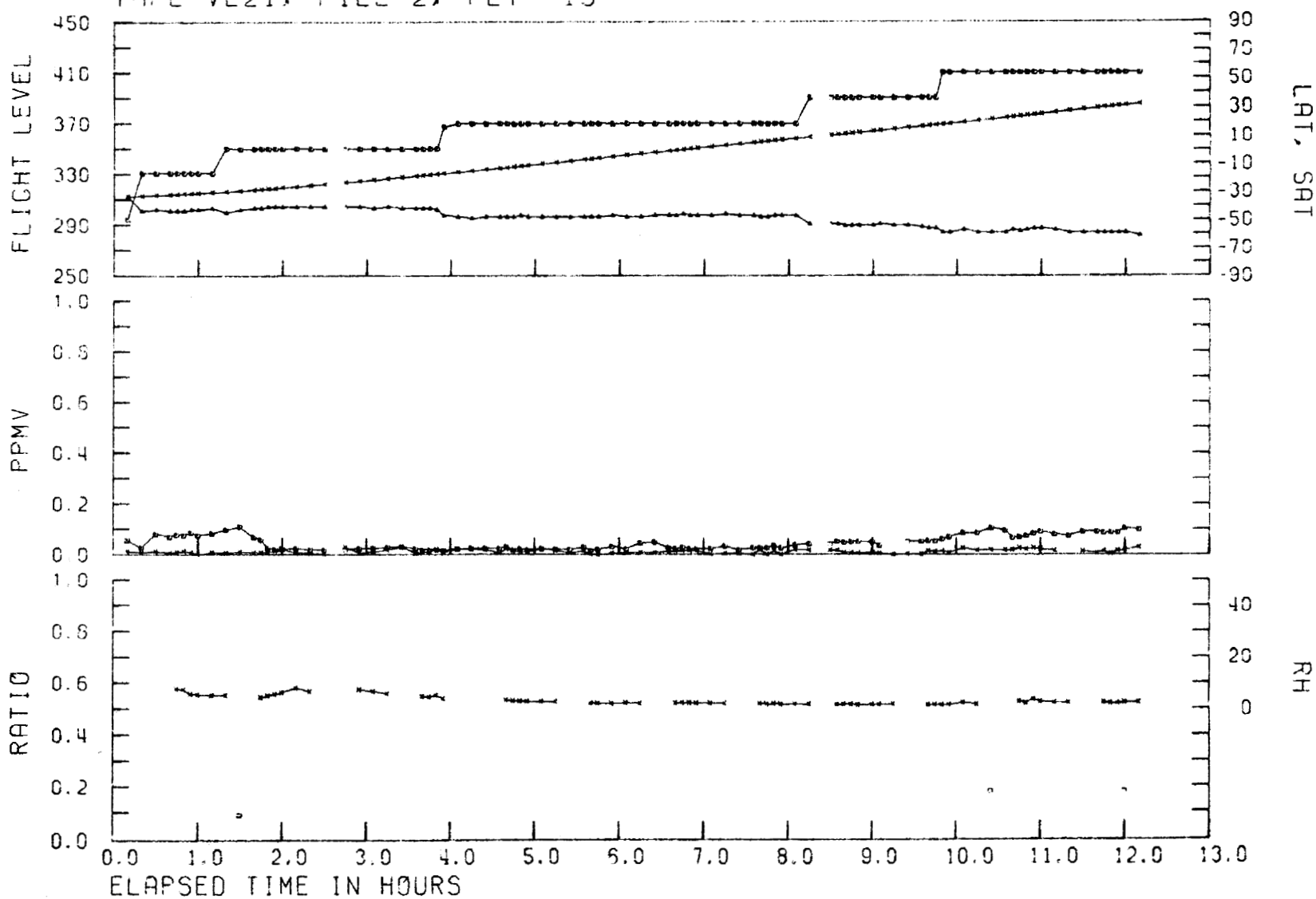
B-137

AKL TO SYD DEPARTURE 6 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 18



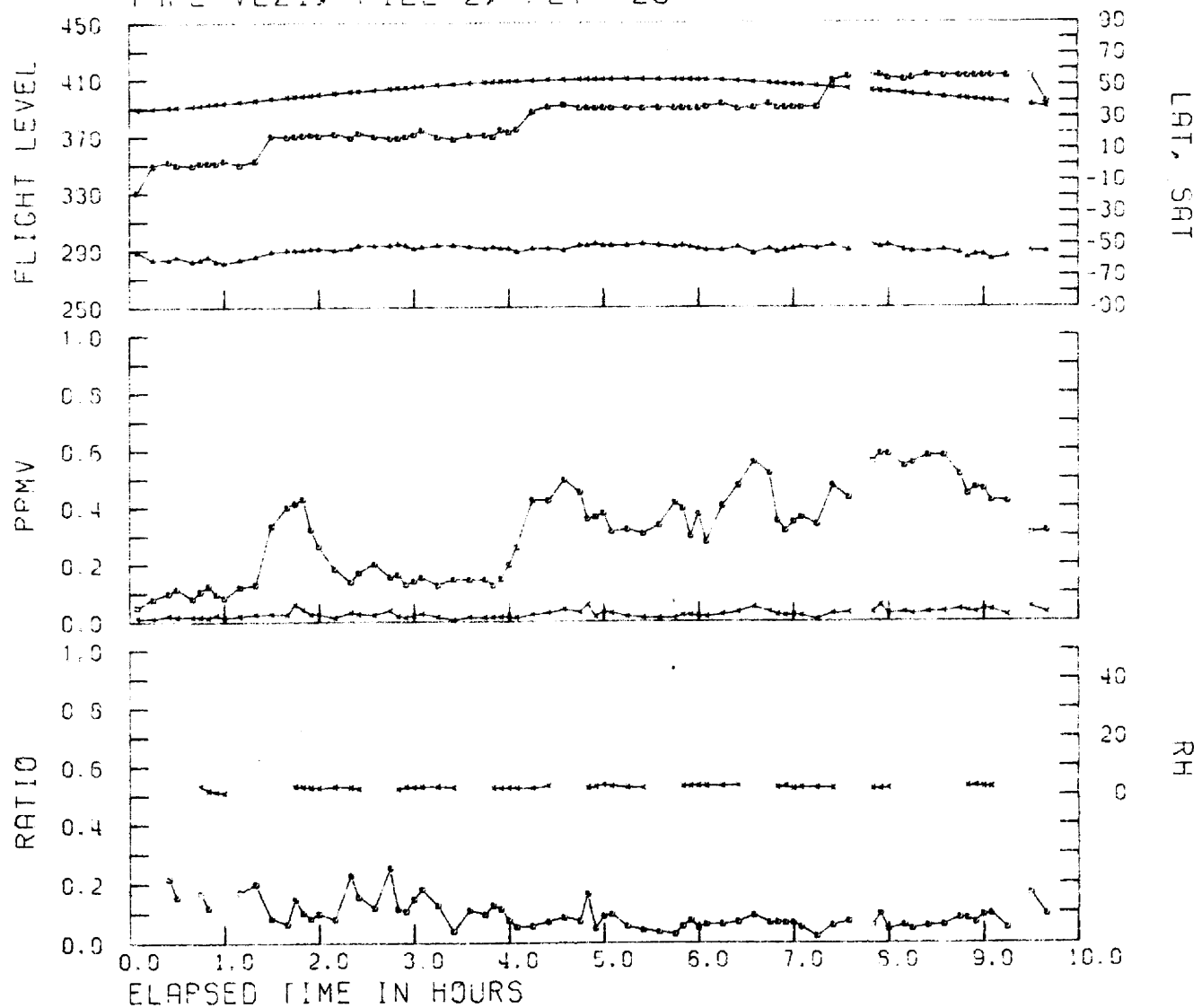
SYD TO LAX DEPARTURE 7 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 19

B-139

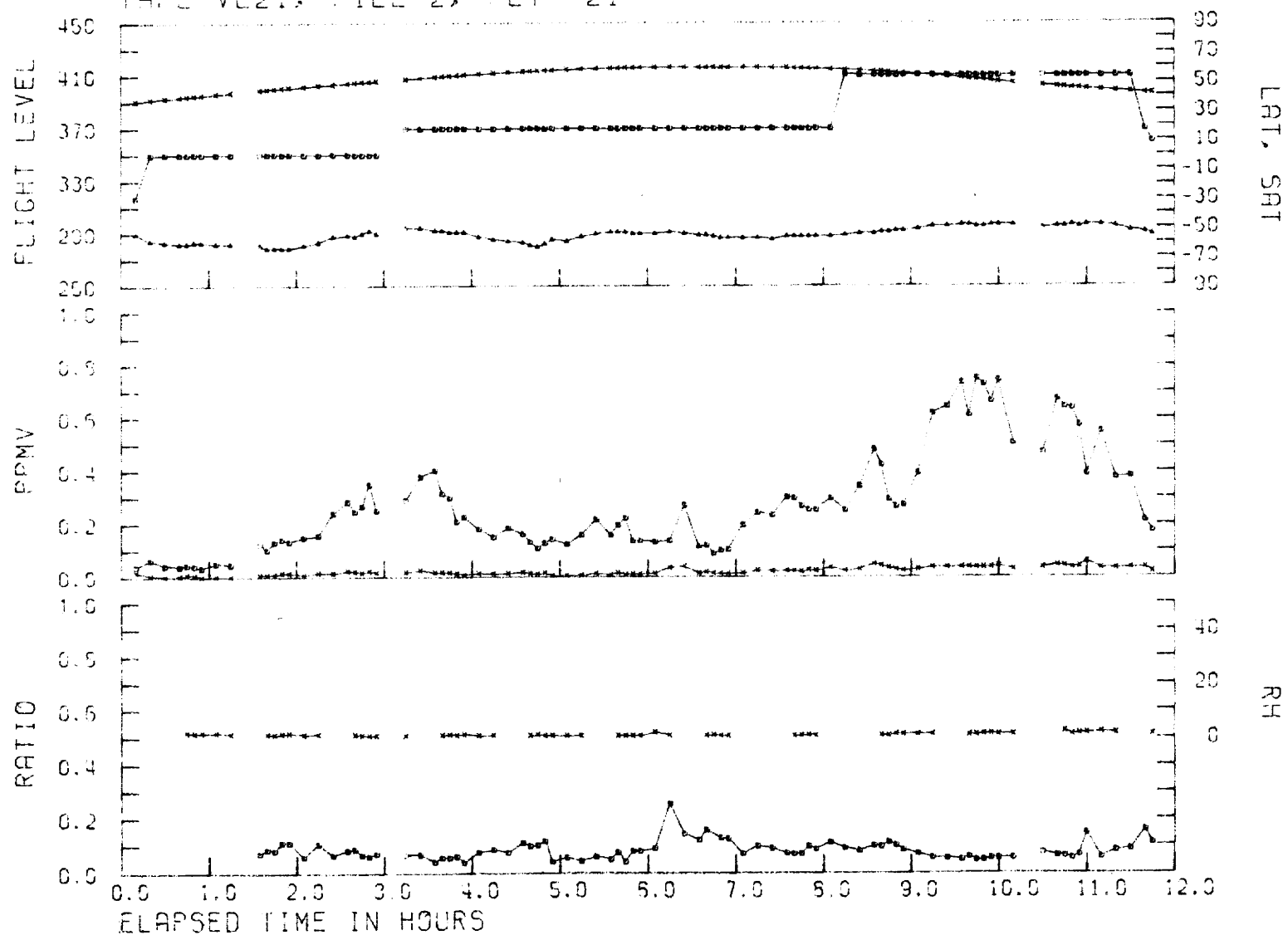


LAX TO NRT DEPARTURE 7 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 20

B-140



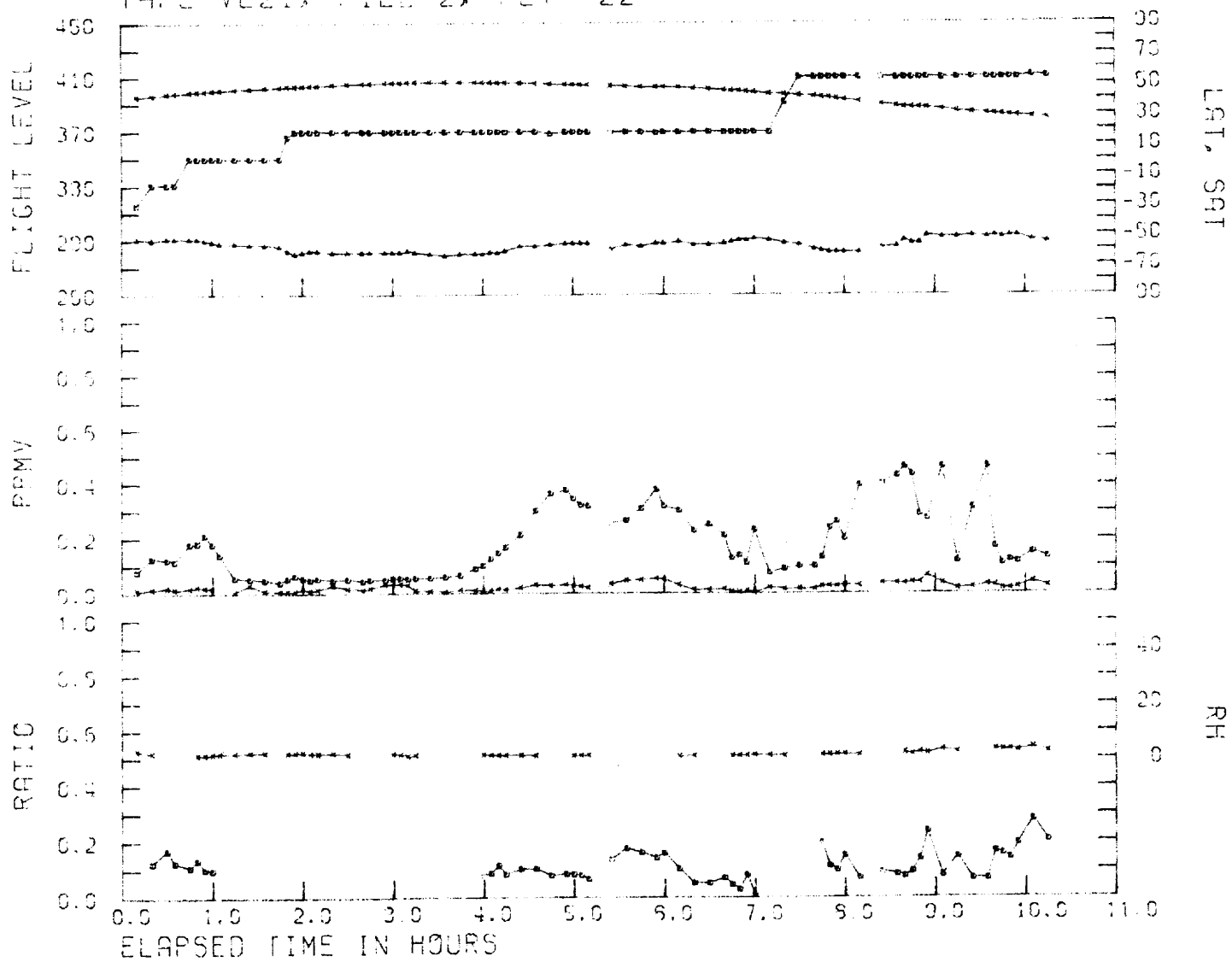
NRT TO JFK DEPARTURE 8 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 21



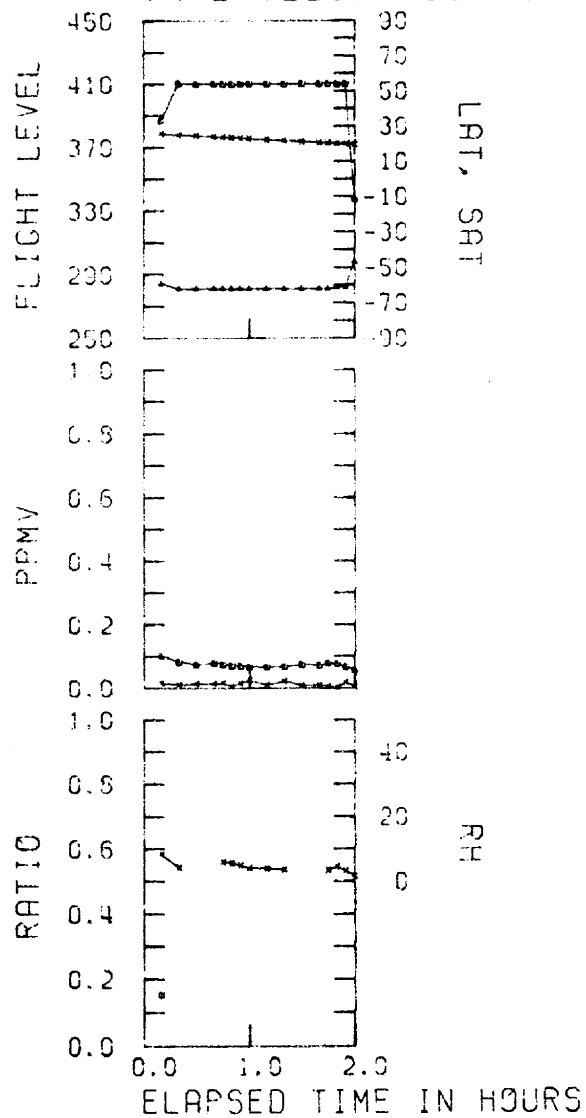
B-141

JFK TO BAH DEPARTURE 9 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 22

B-142

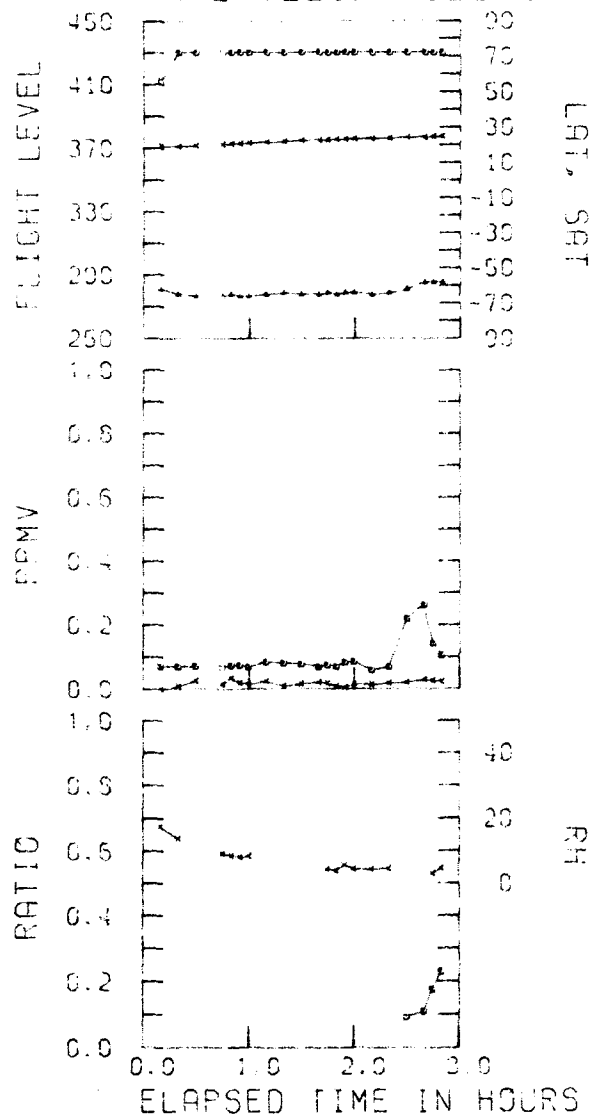


BAH TO BOM DEPARTURE 10 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 23



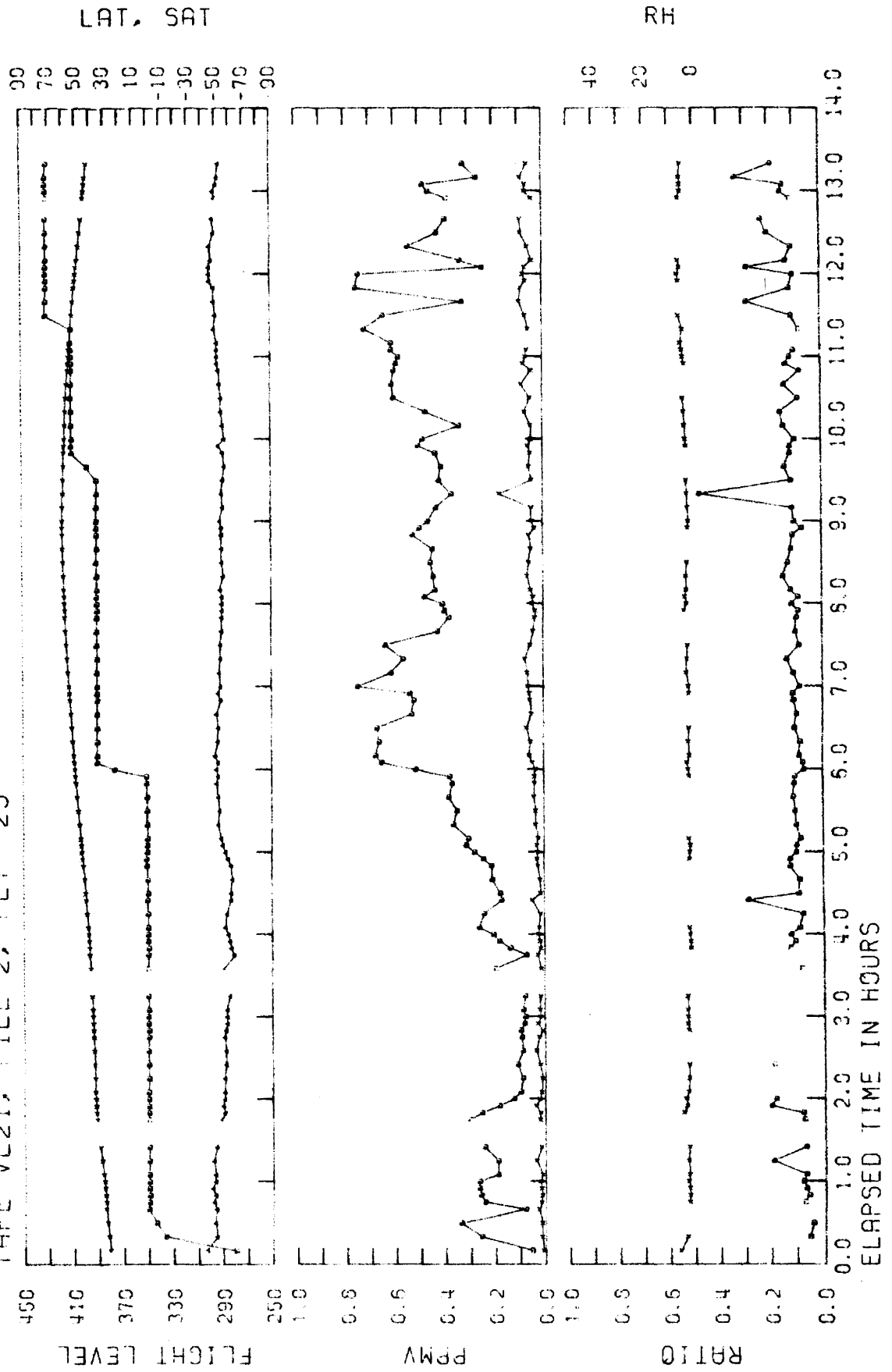
B-143

BOM TO BAH DEPARTURE 10 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 24



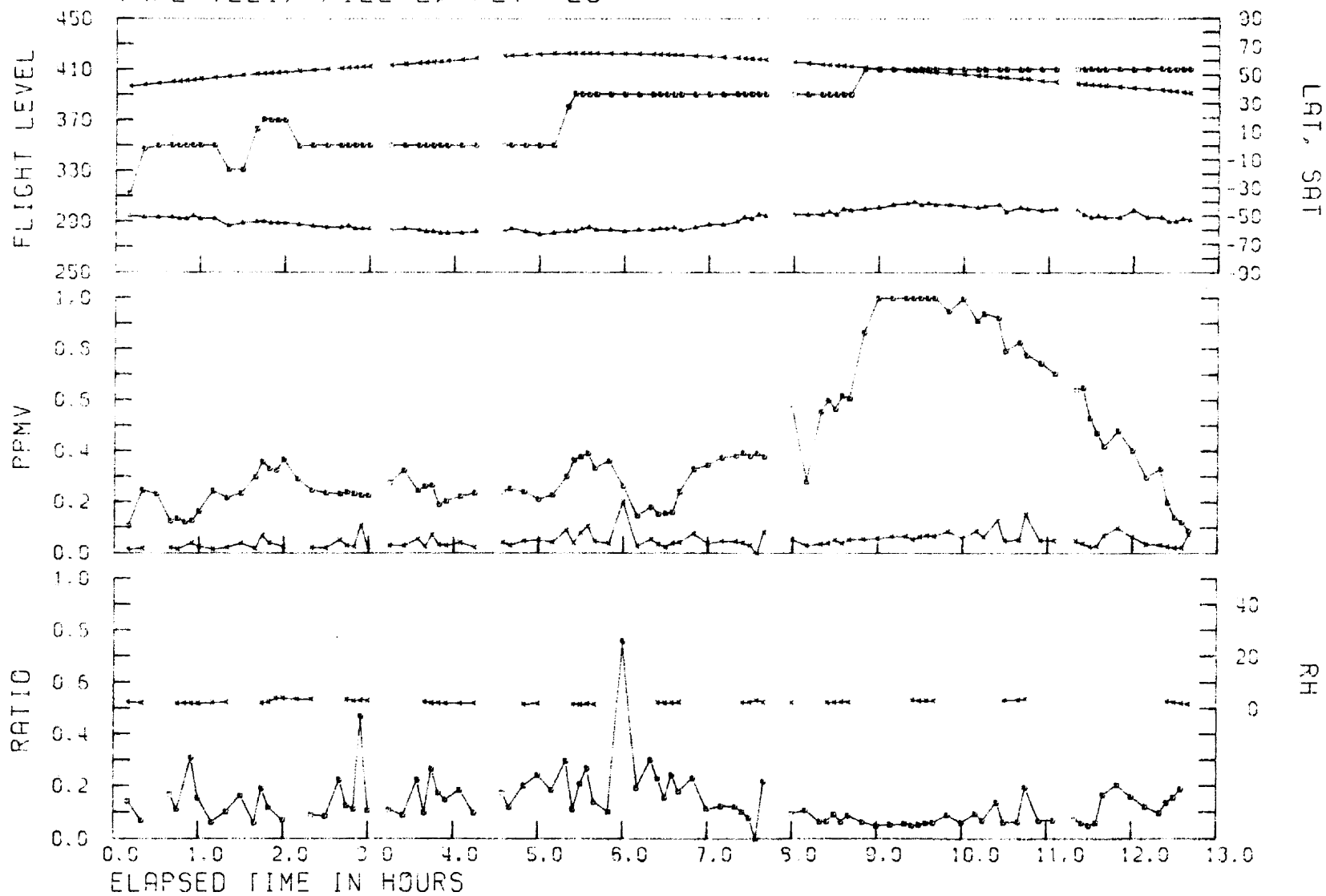
B-144

BAH TO JFK DEPARTURE 10 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 25

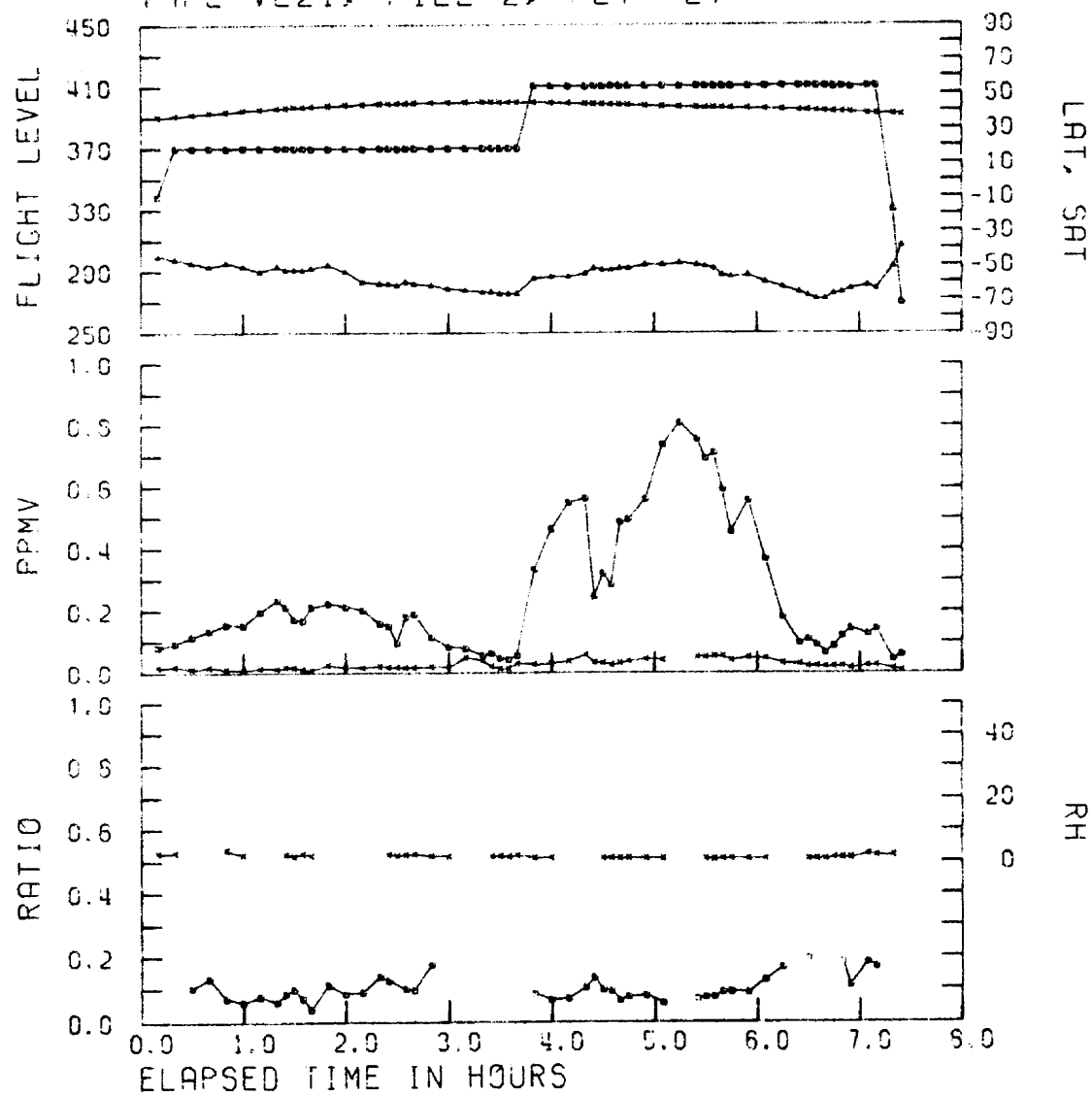


JFK TO NRT DEPARTURE 11 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 26

B-146

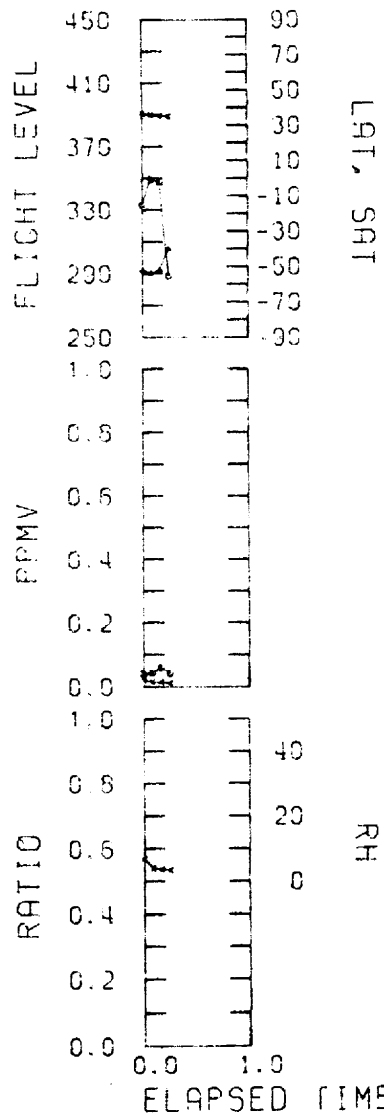


NRT TO SFO DEPARTURE 12 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 27

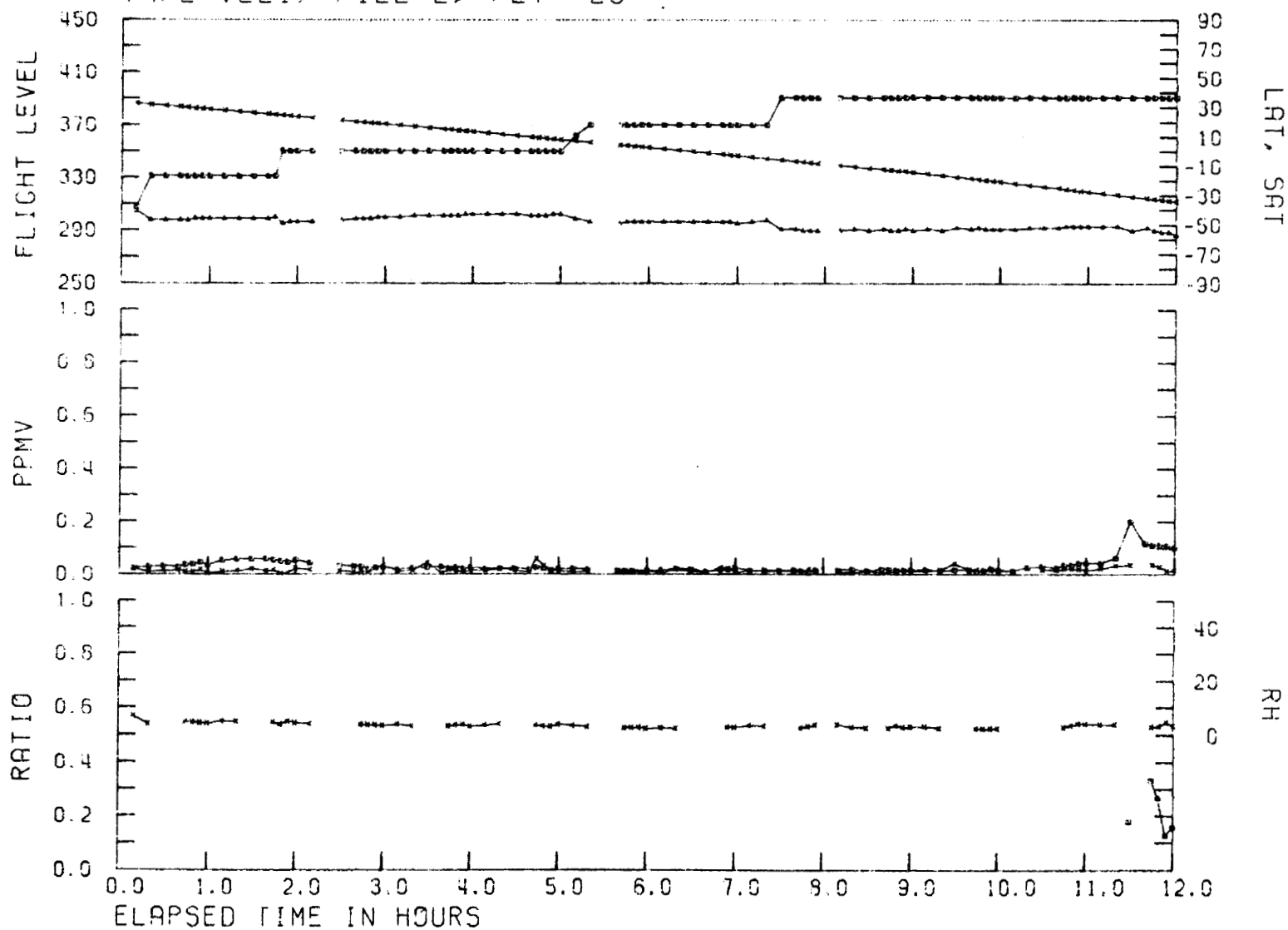


SFO TO LAX DEPARTURE 12 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 28

B-148

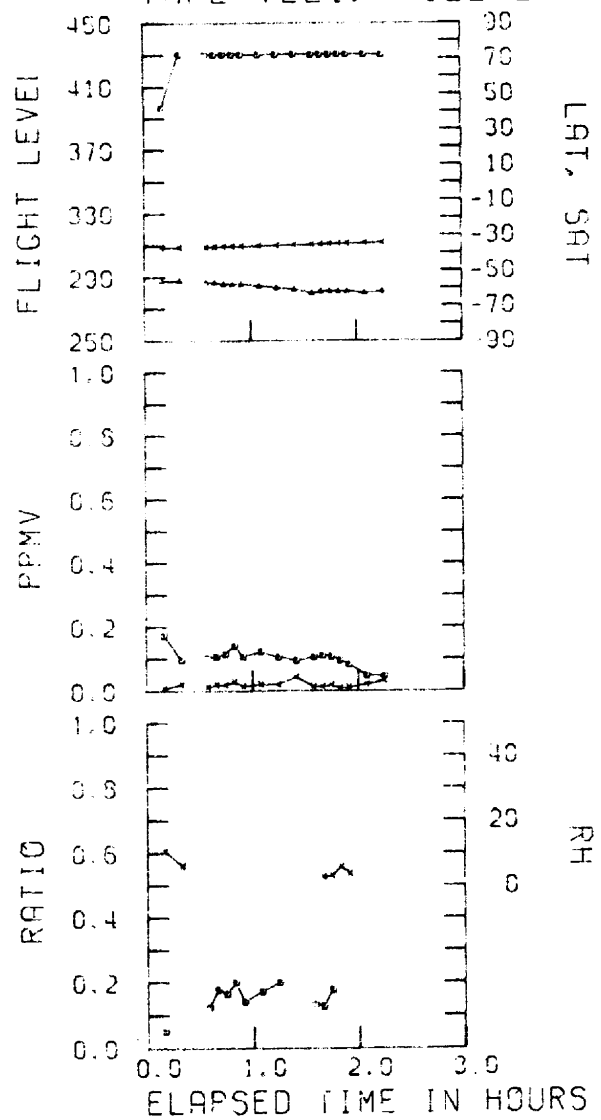


LAX TO AKL DEPARTURE 13 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 29



B-149

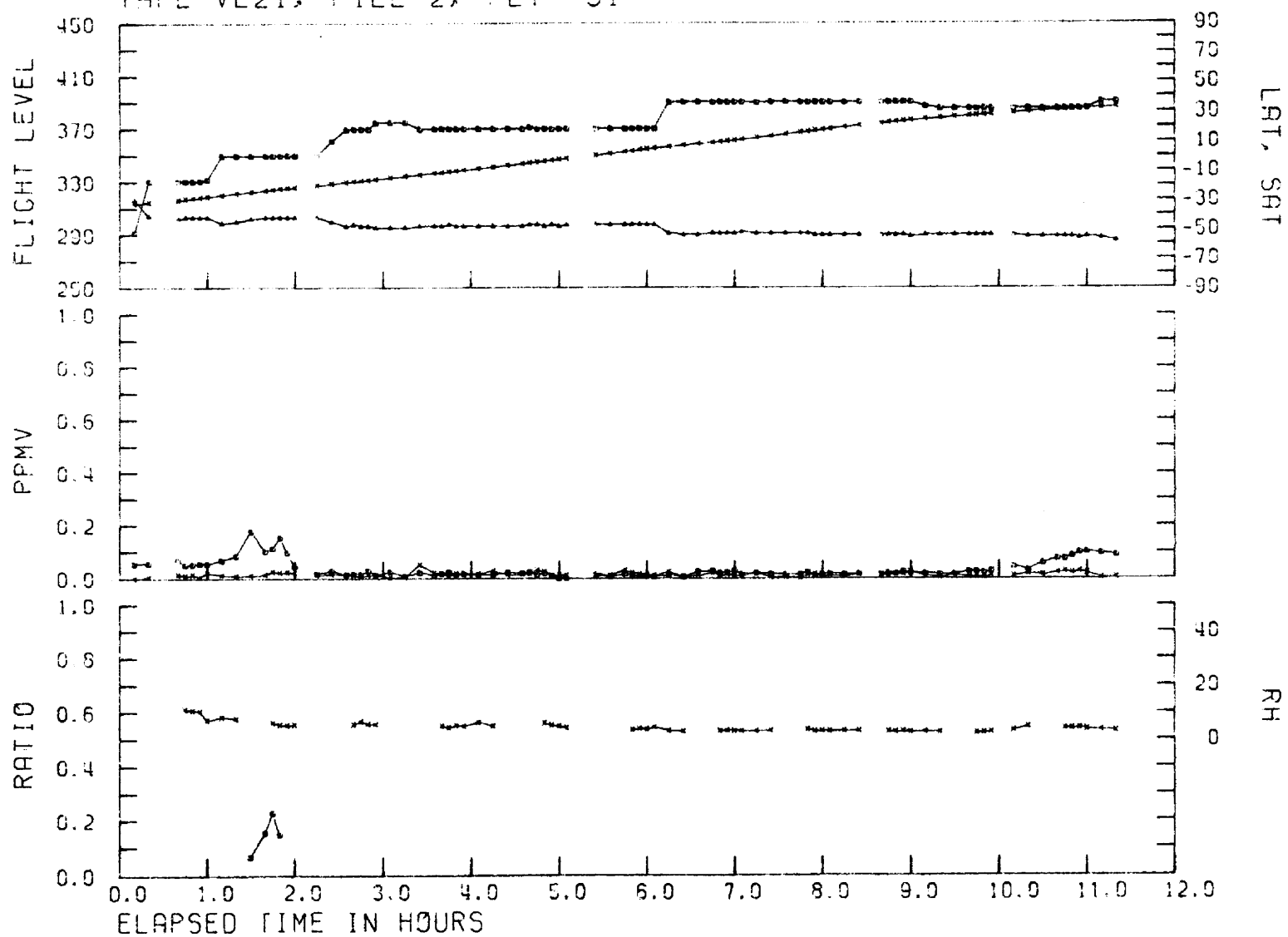
AKL TO SYD DEPARTURE 13 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 30



B-150

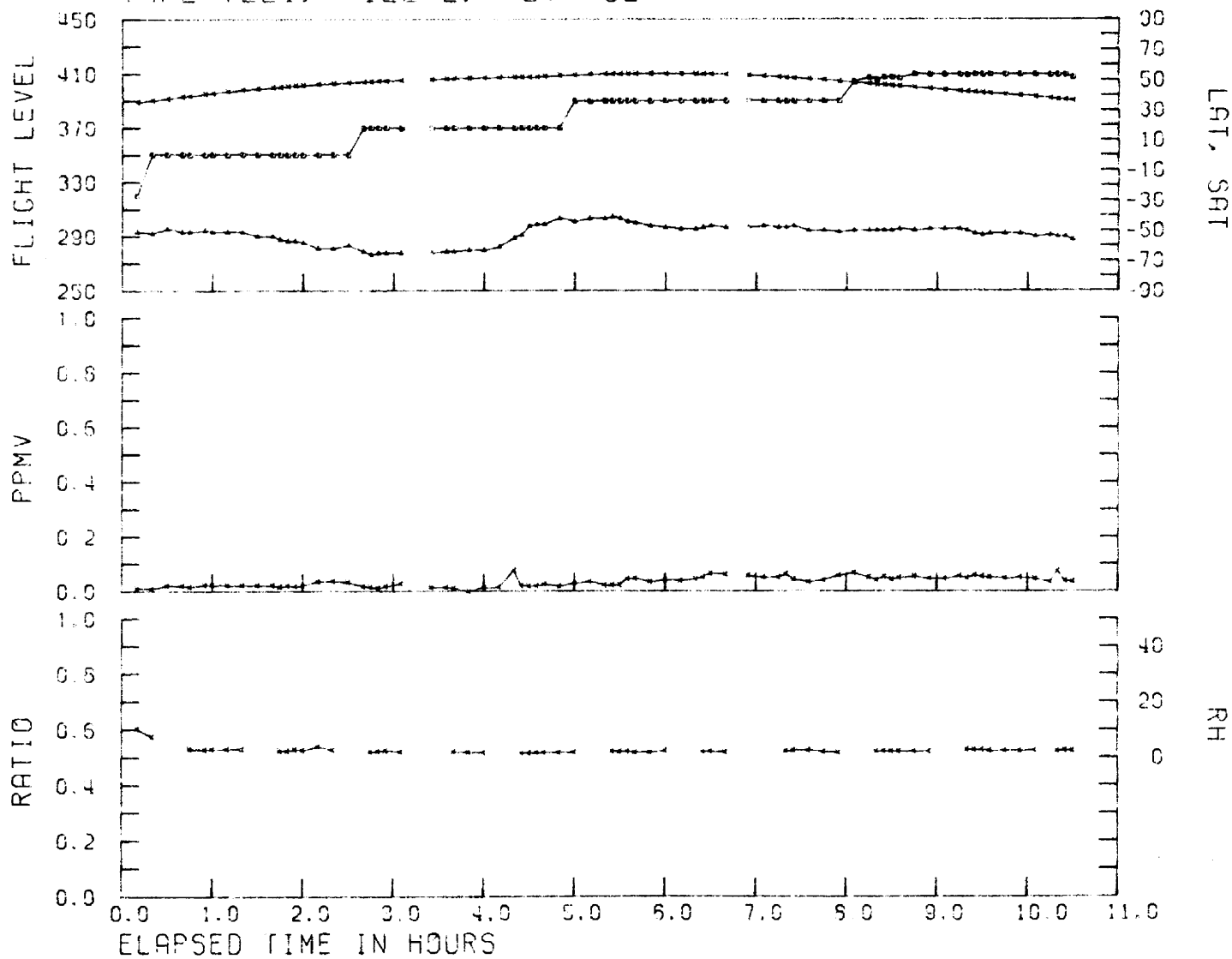
SYD TO LAX DEPARTURE 14 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 31

B-151

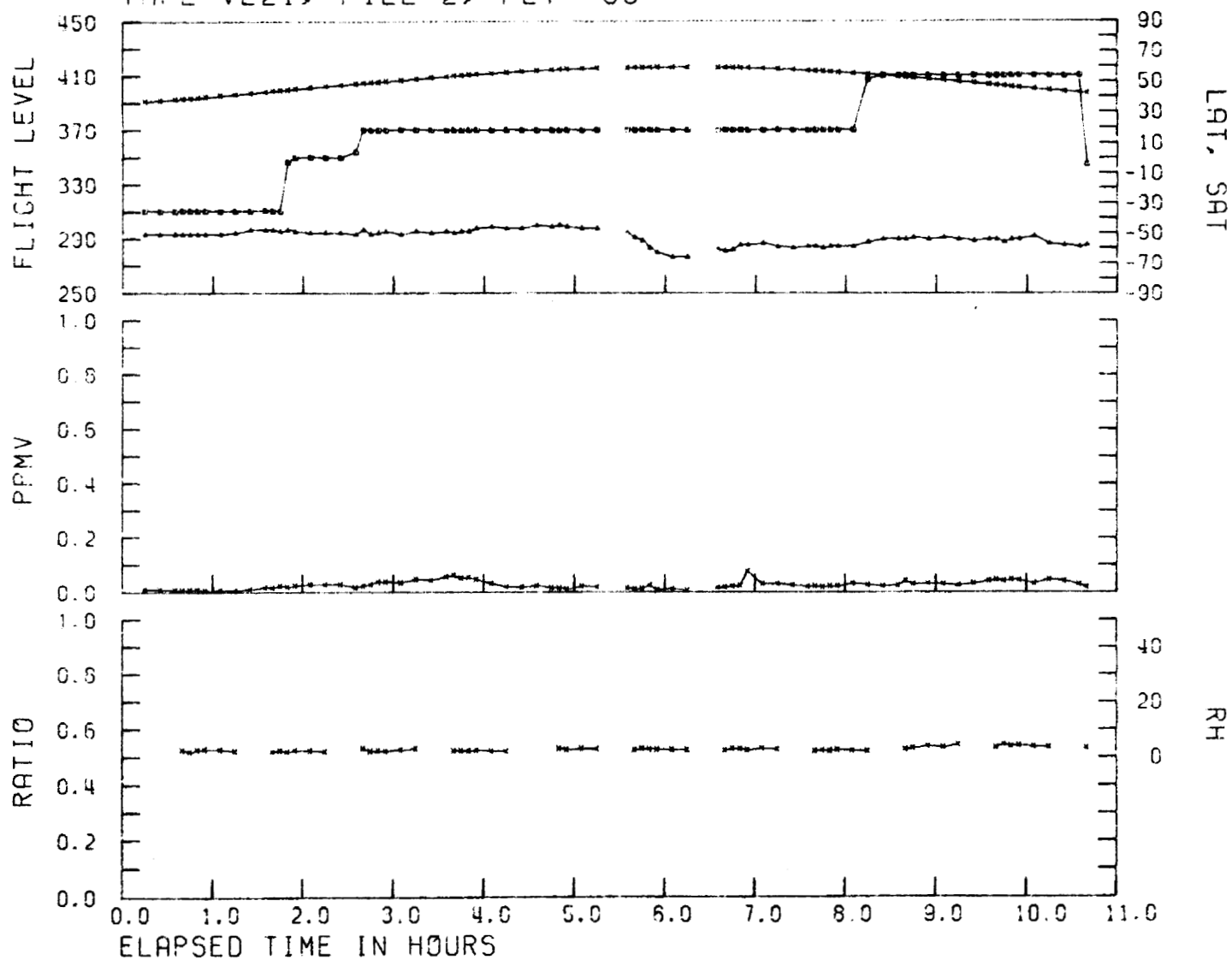


LAX TO NRT DEPARTURE 14 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 32

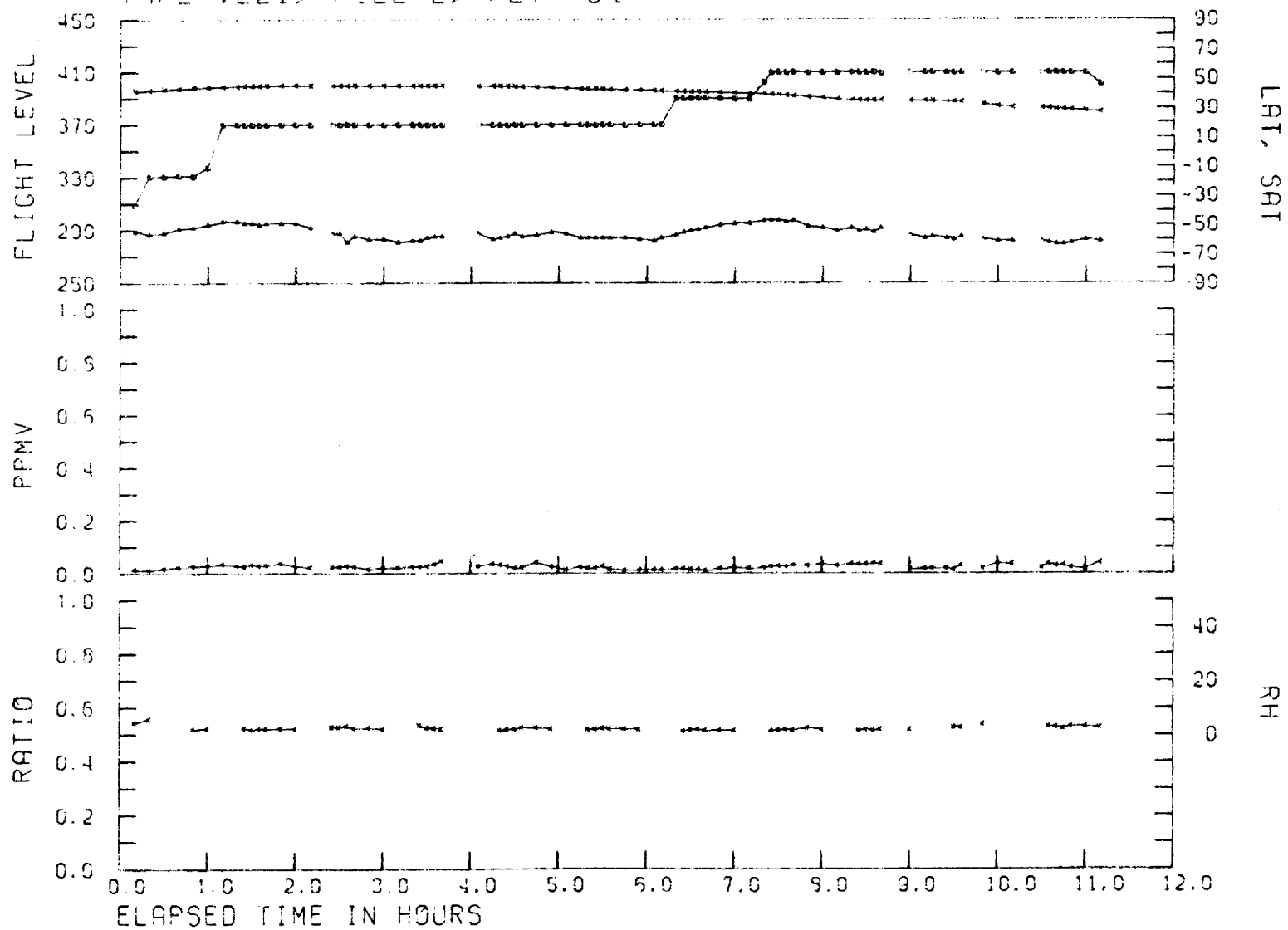
B-152



NRT TO JFK DEPARTURE 15 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 33

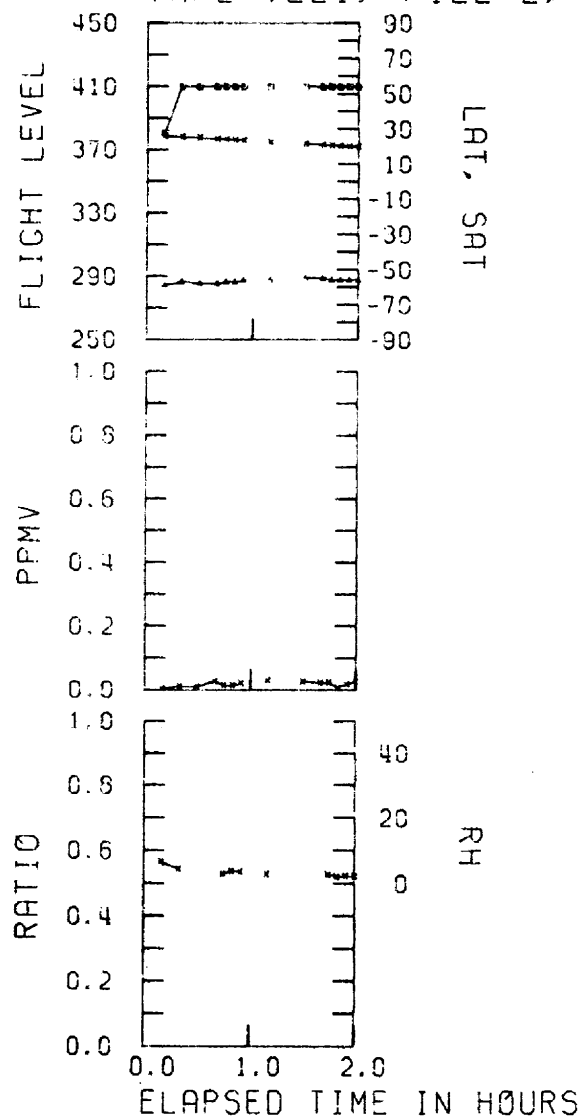


JFK TO BAH DEPARTURE 16 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 34

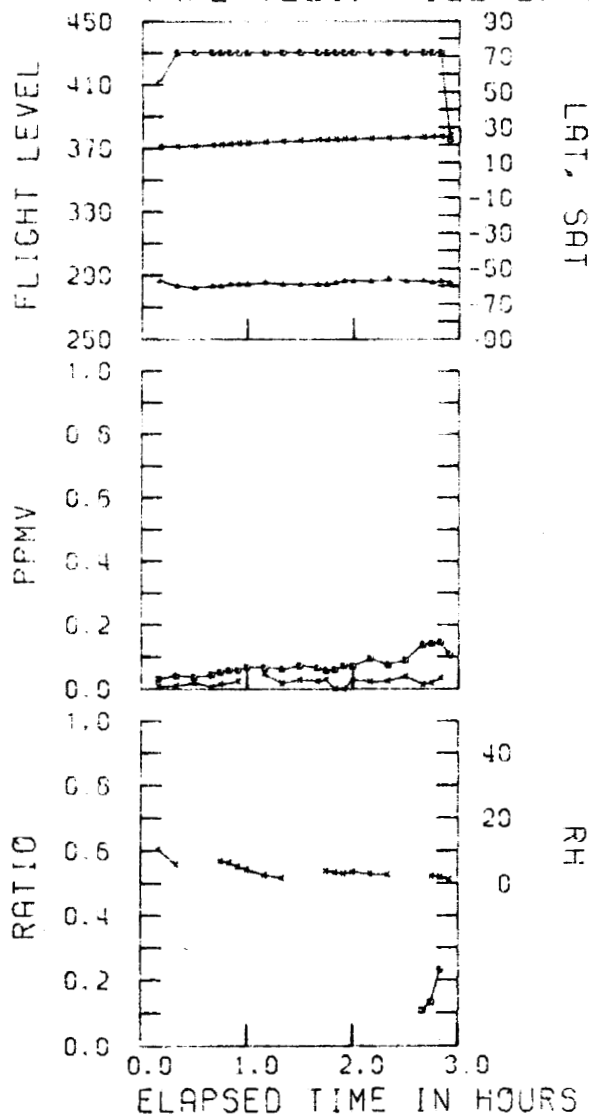


B-154

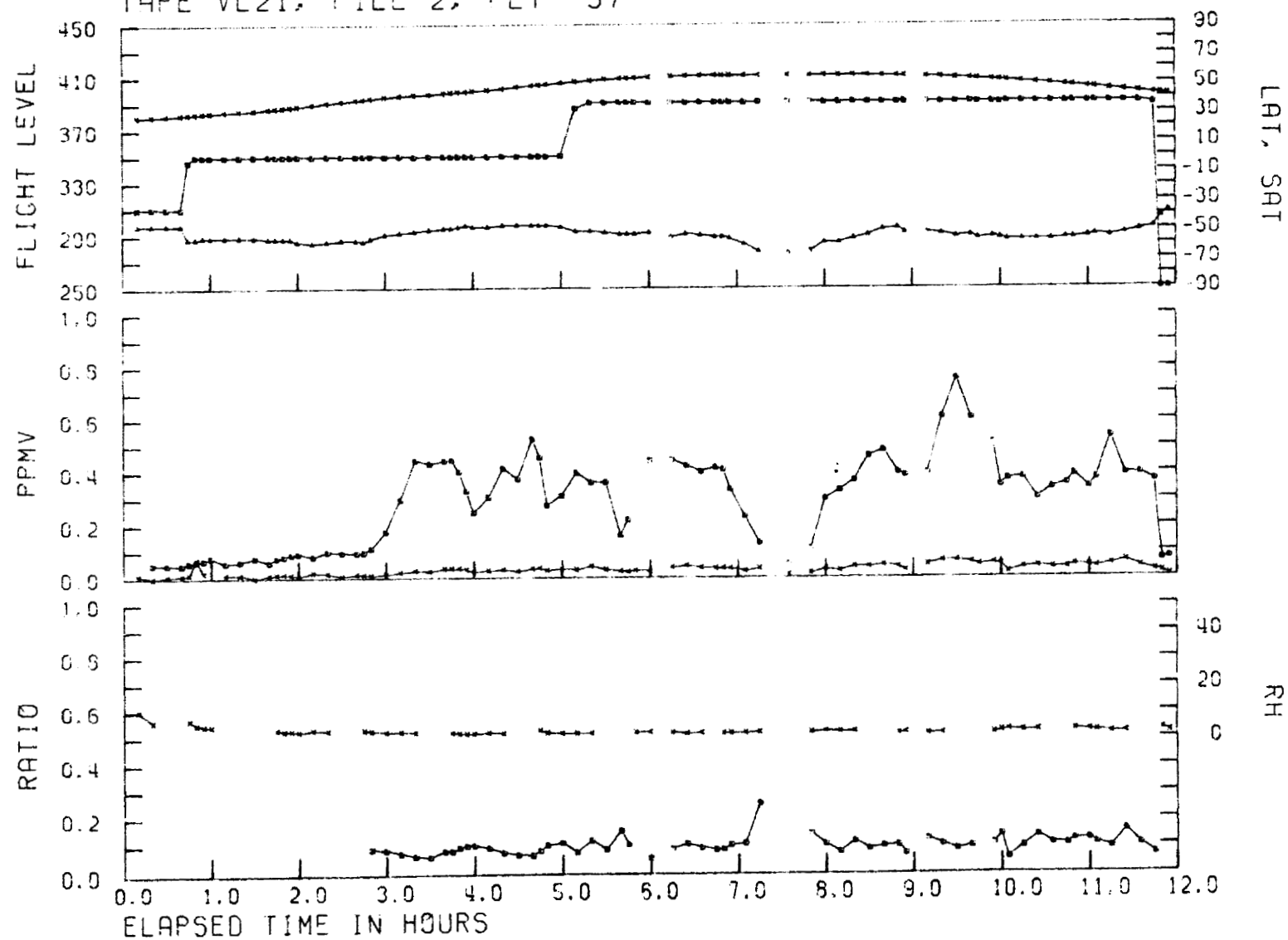
BAH TO BOM DEPARTURE 17 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 35



BOM TO BAH DEPARTURE 17 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 36

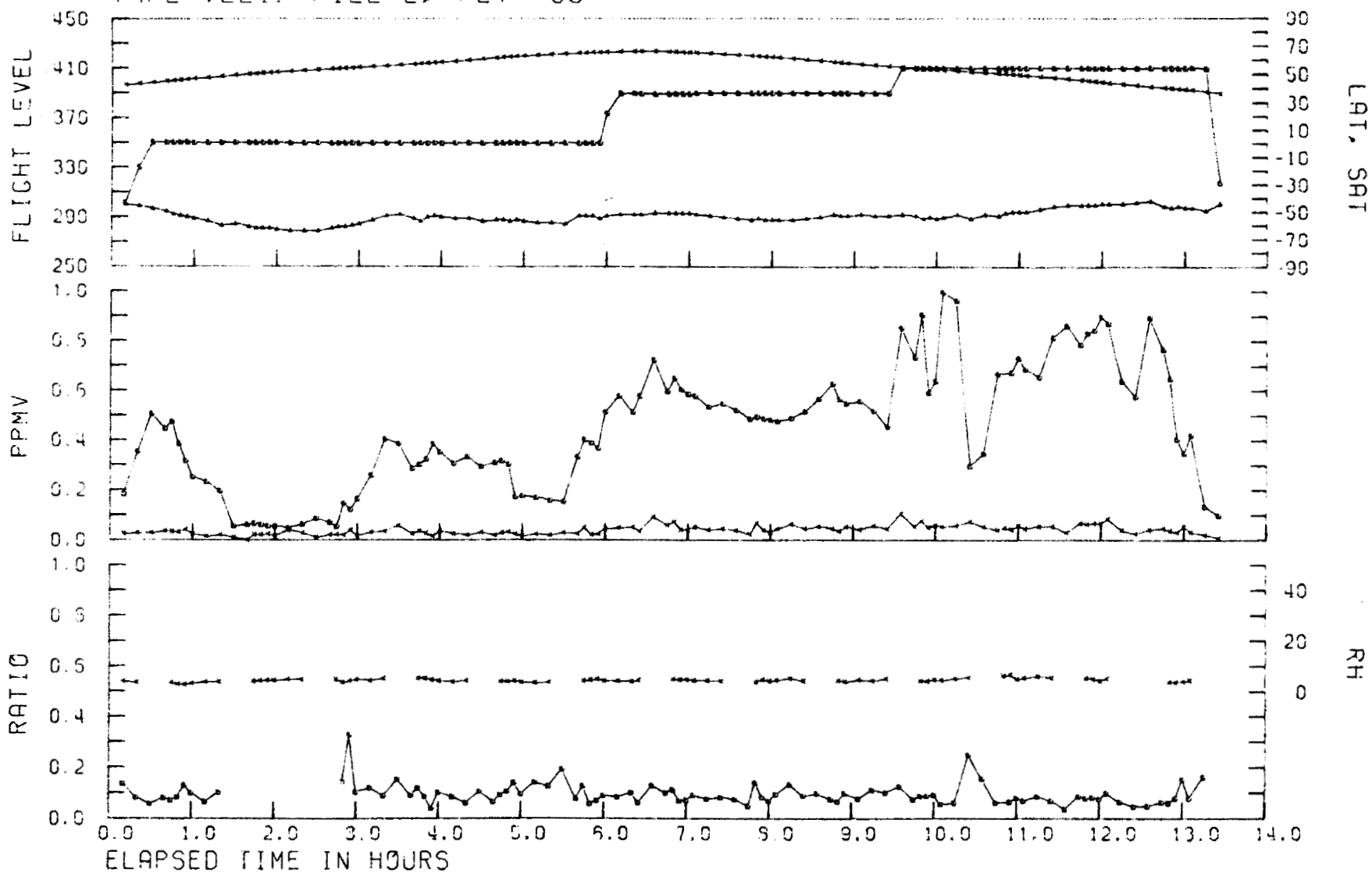


BAH TO JFK DEPARTURE 17 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 37



B-157

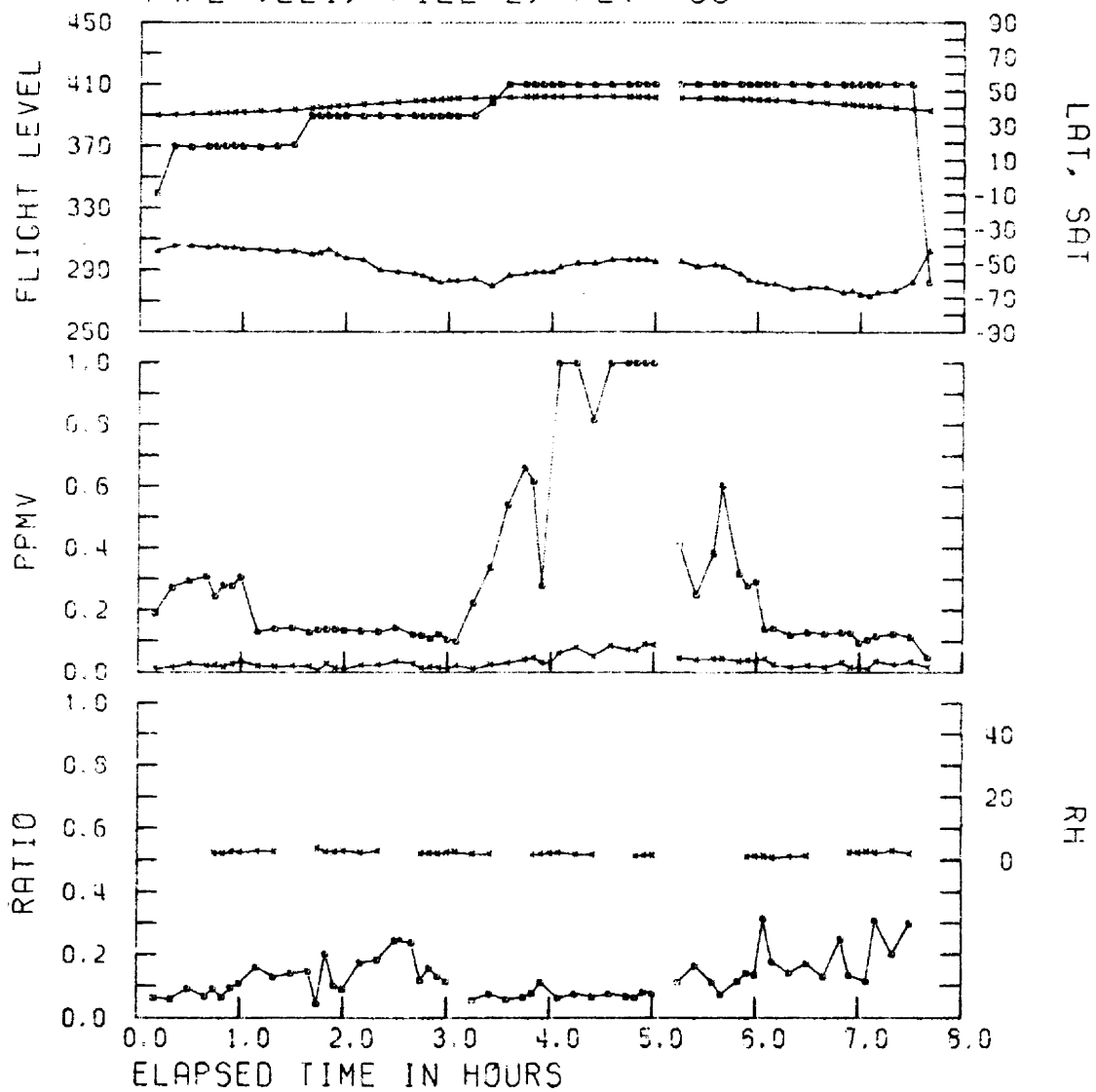
JFK TO NRT DEPARTURE 18 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 38



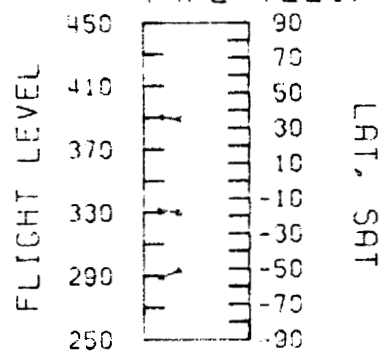
B-158

NRT TO SFO DEPARTURE 19 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 39

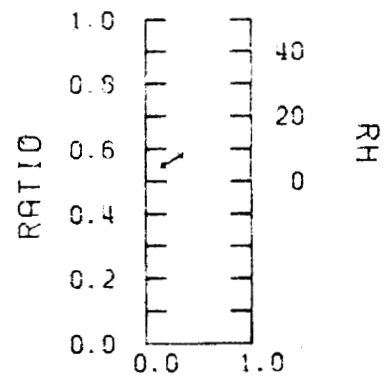
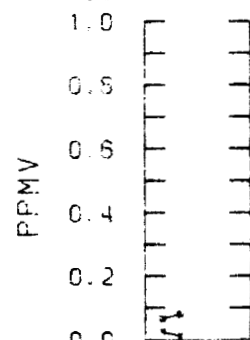
B-159



SFO TO LAX DEPARTURE 19 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 40



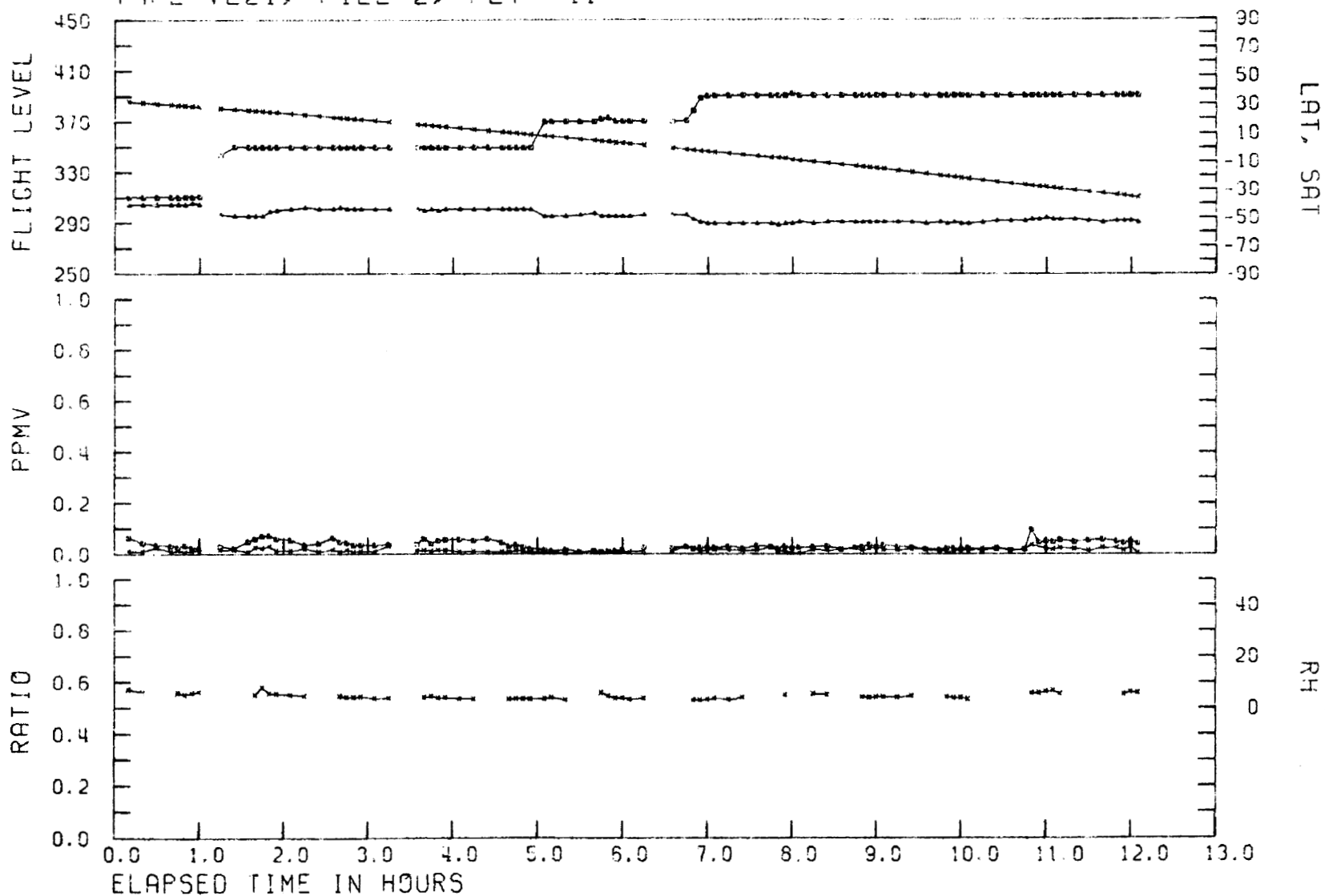
LAT, SAT



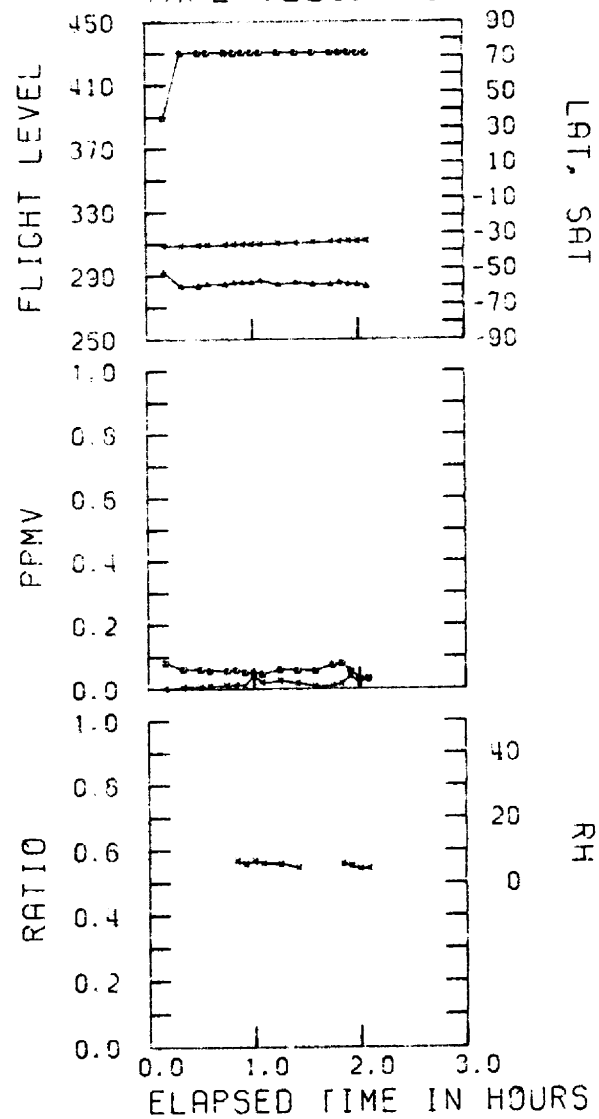
ELAPSED TIME IN HOURS

B-160

LAX TO AKL DEPARTURE 20 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 41

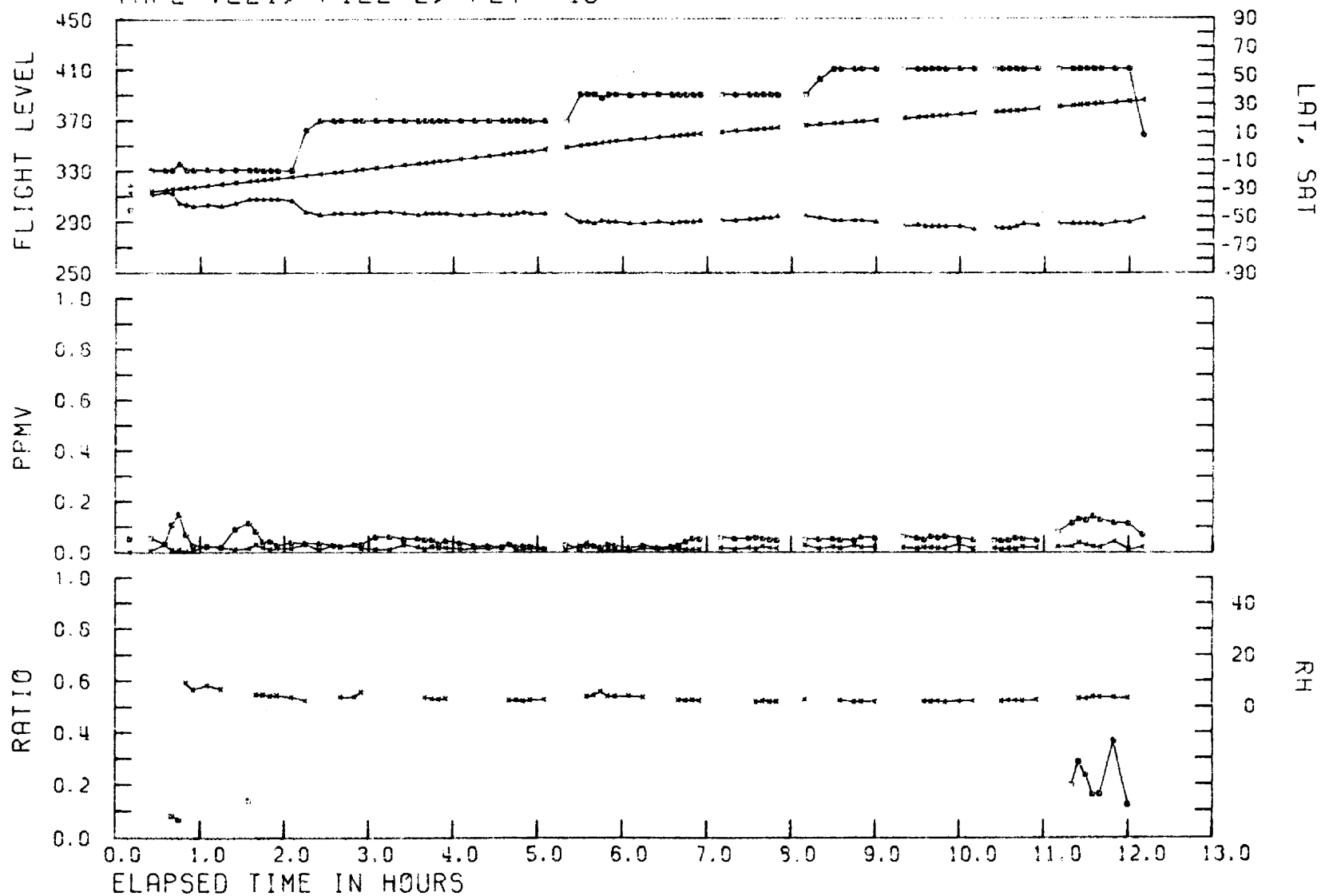


AKL TO SYD DEPARTURE 20 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 42



B-162

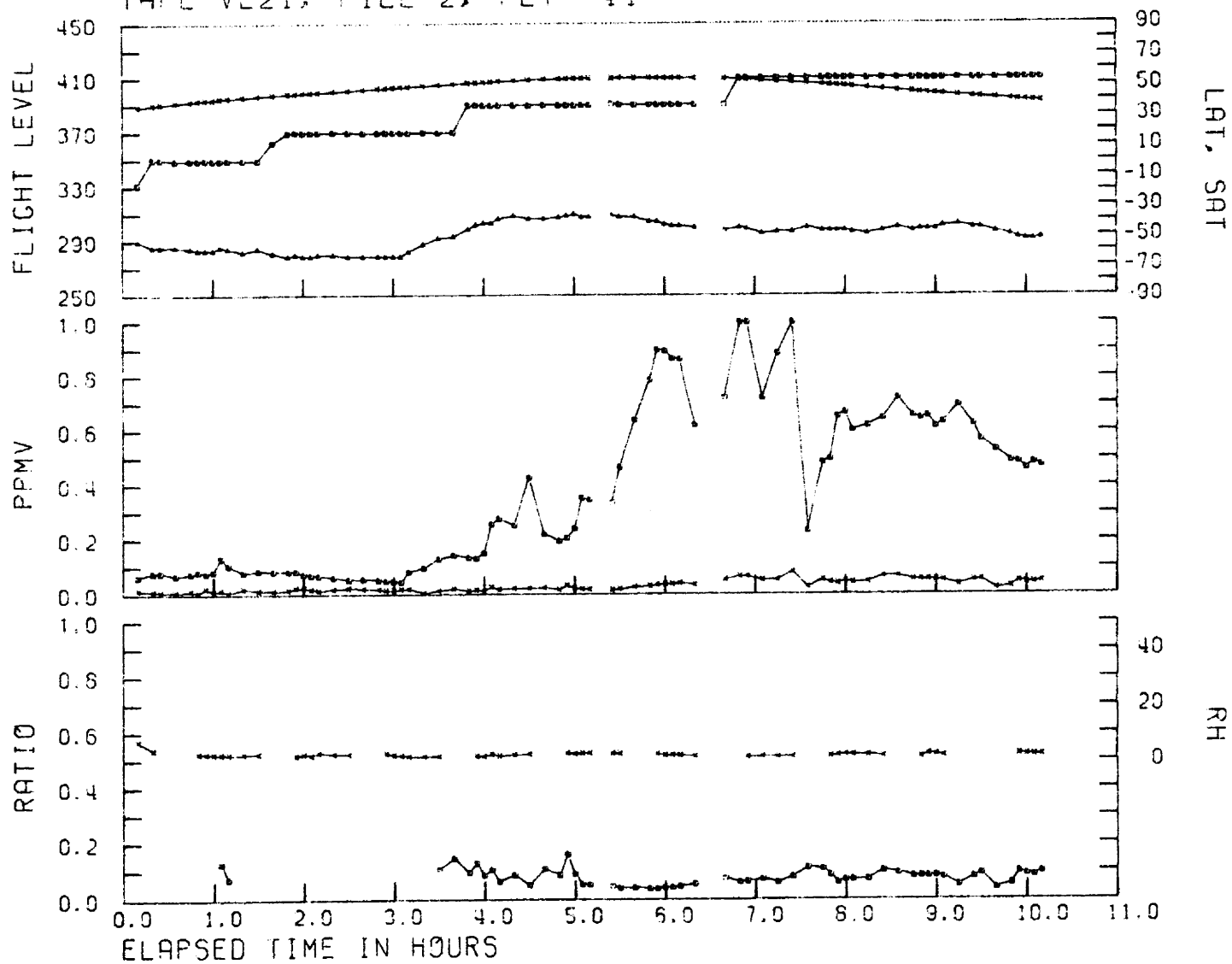
SYD TO LAX DEPARTURE 21 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 43



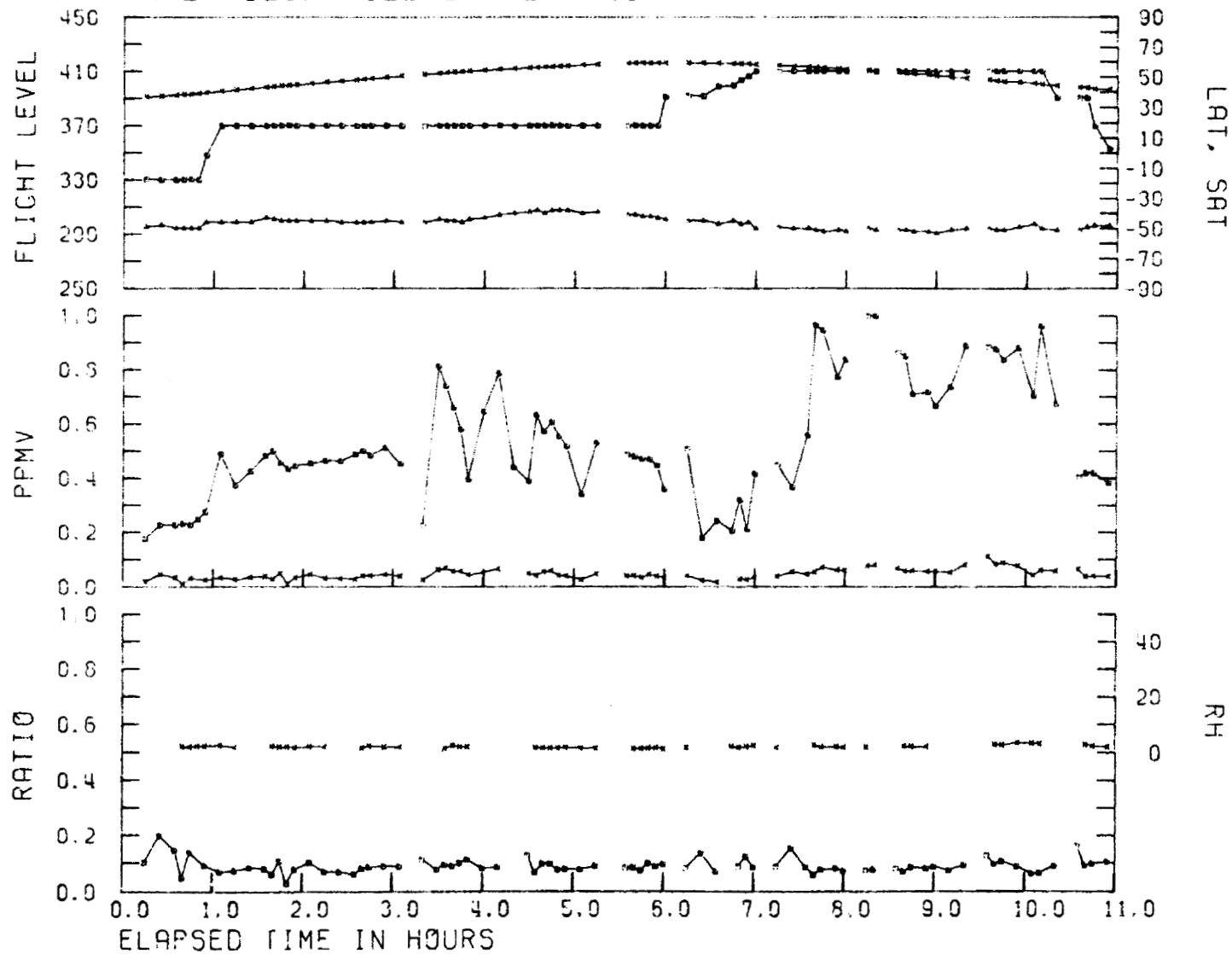
B-163

LAX TO NRT DEPARTURE 21 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 44

B-164

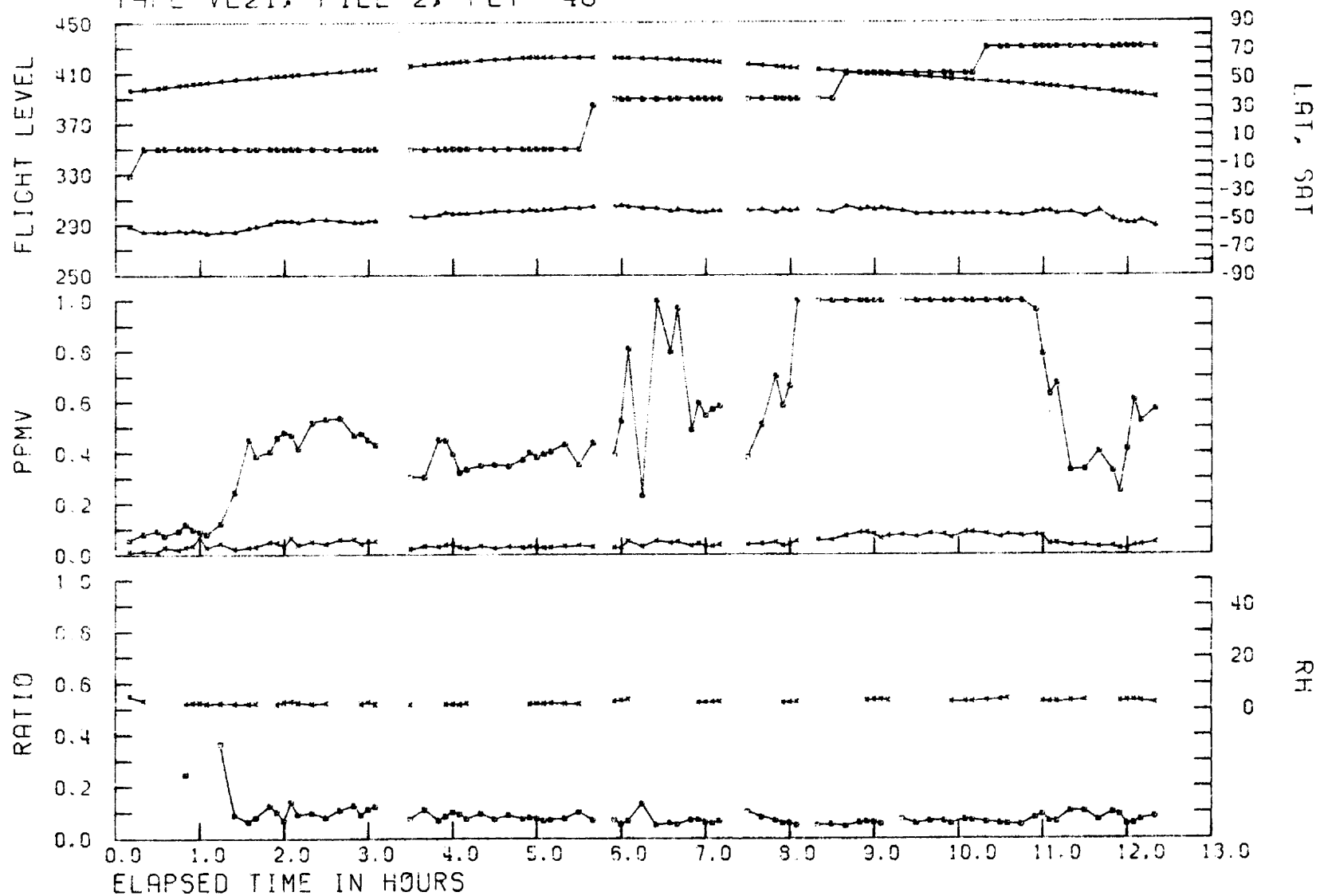


NRT TO JFK DEPARTURE 22 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 45



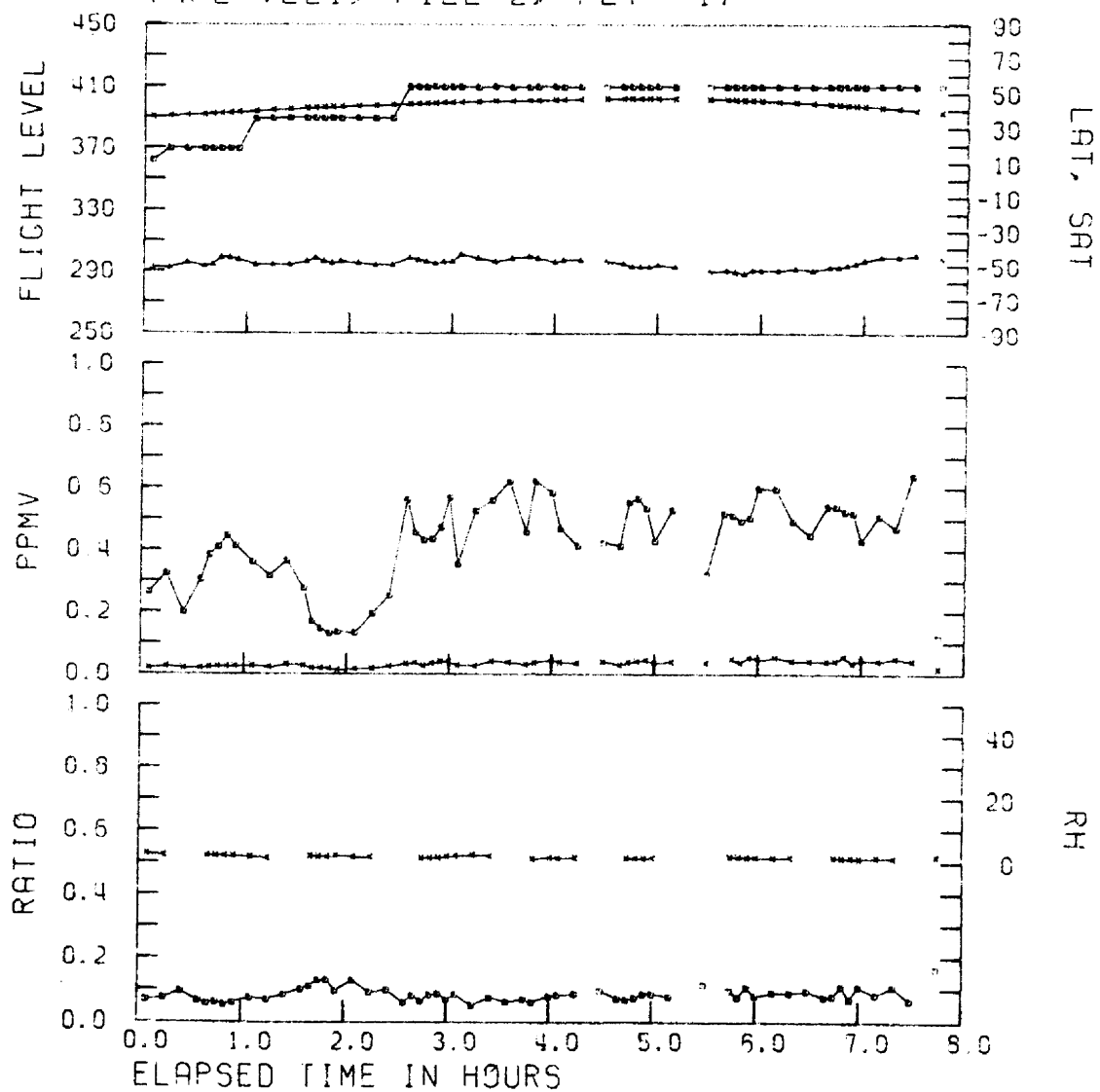
JFK TO NRT DEPARTURE 23 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 46

991-8



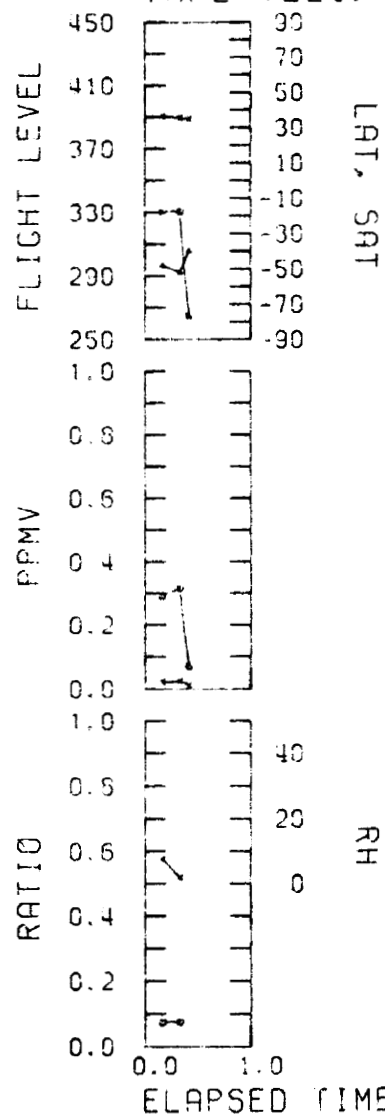
NRT TO SFO DEPARTURE 24 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 47

B-167

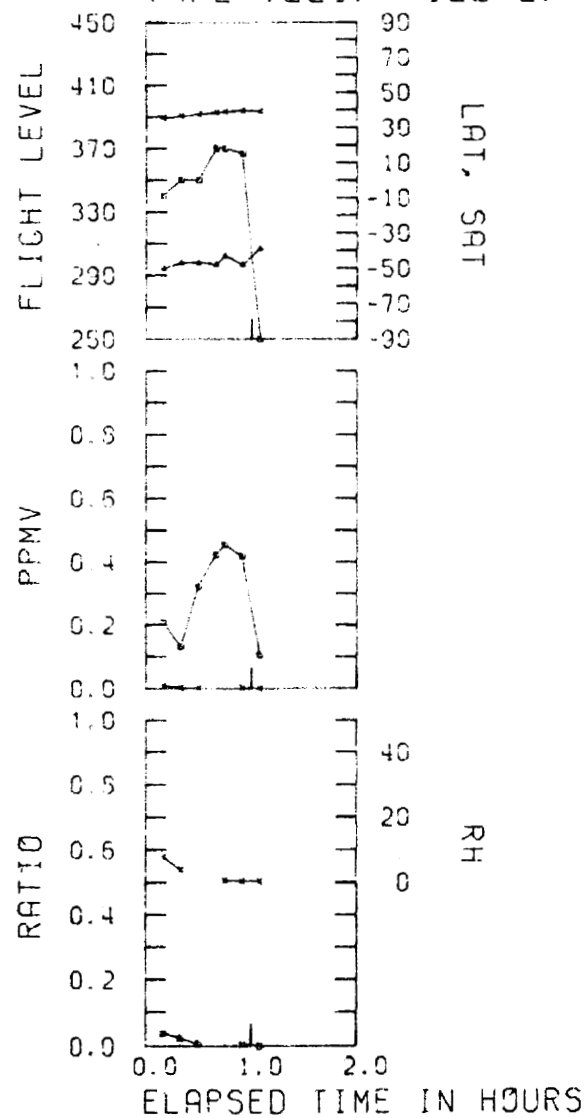


SFO TO LAX DEPARTURE 24 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 48

89T-8

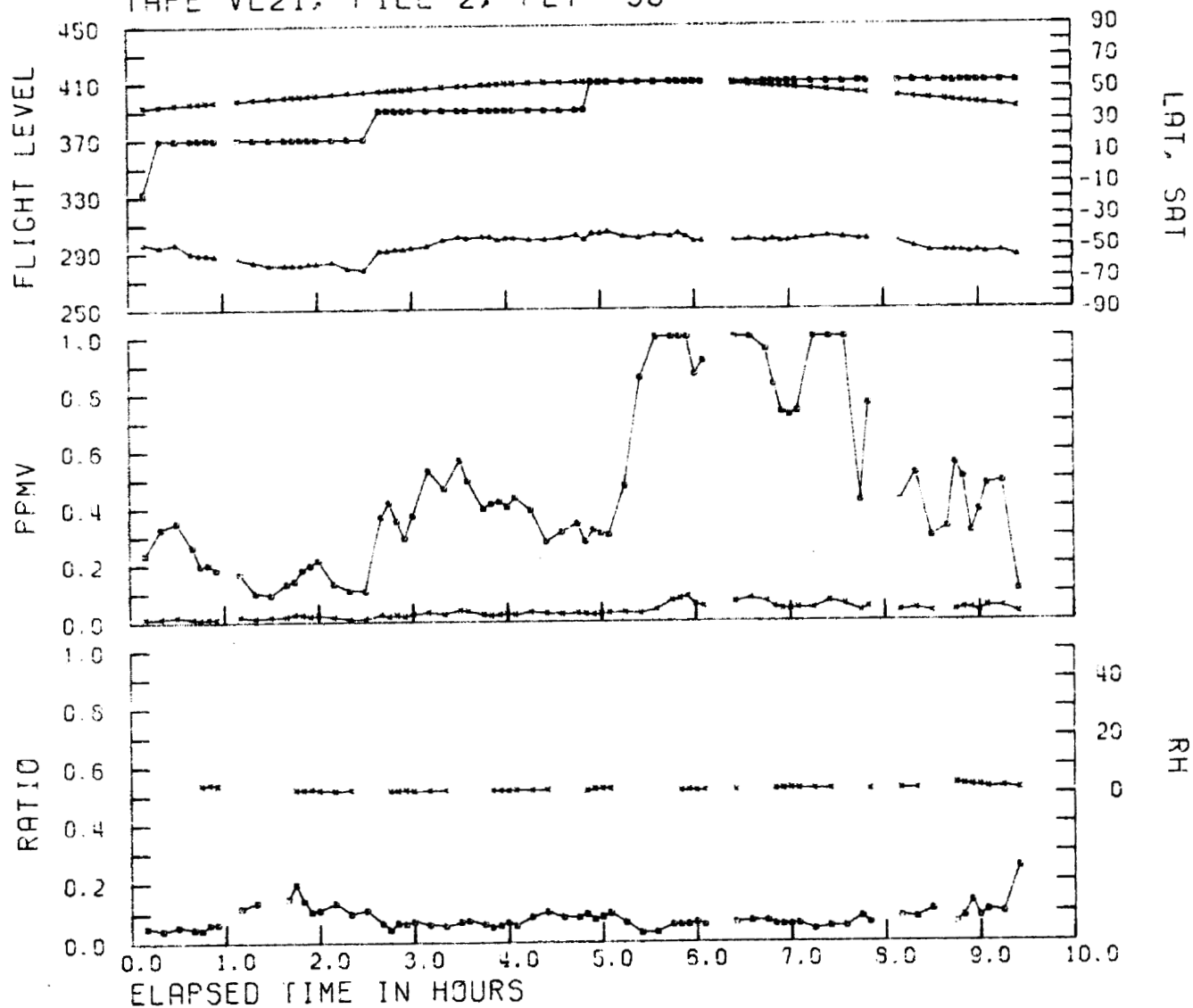


LAX TO SFO DEPARTURE 24 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 49



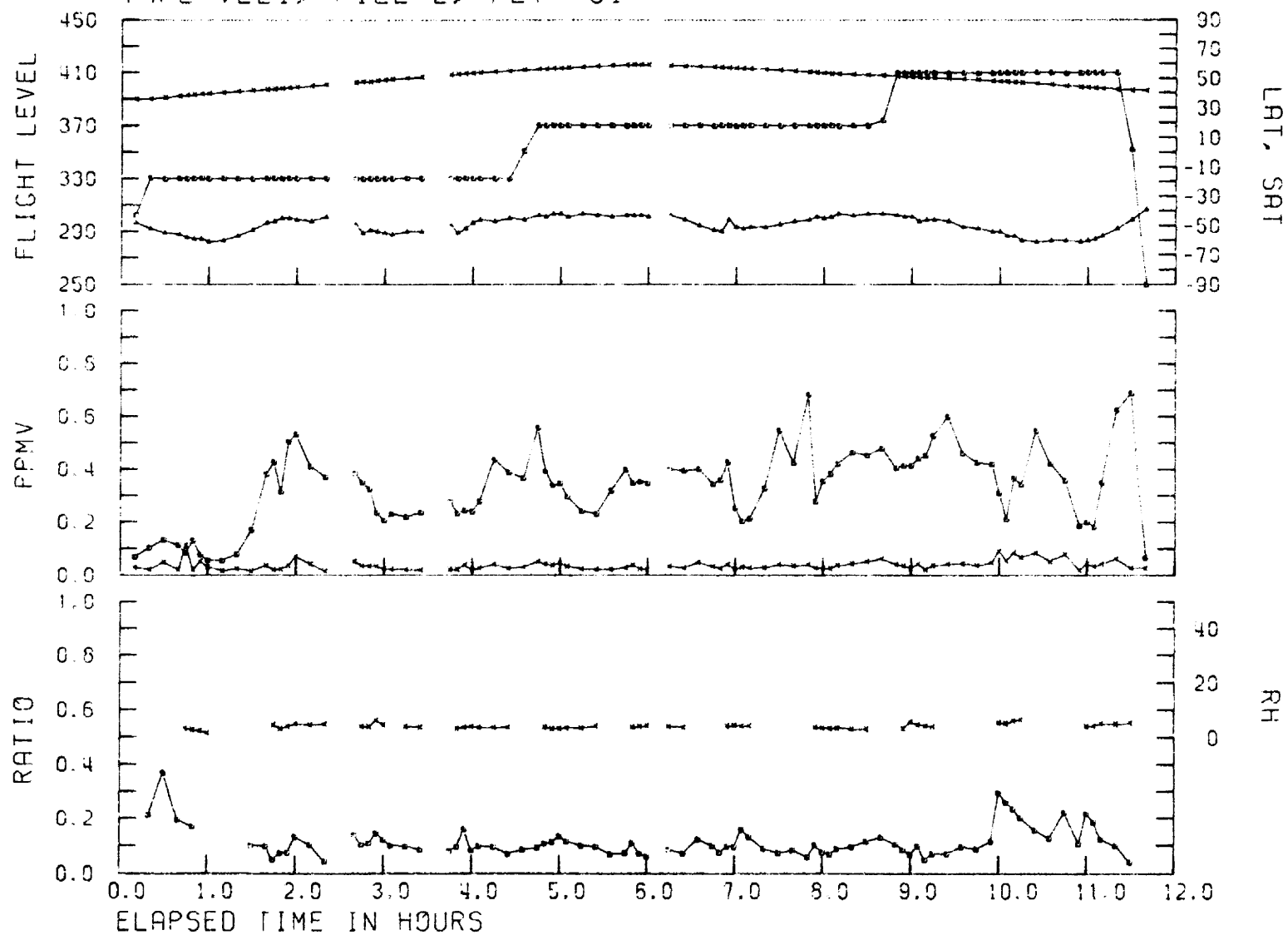
SFO TO NRT DEPARTURE 25 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 50

B-170

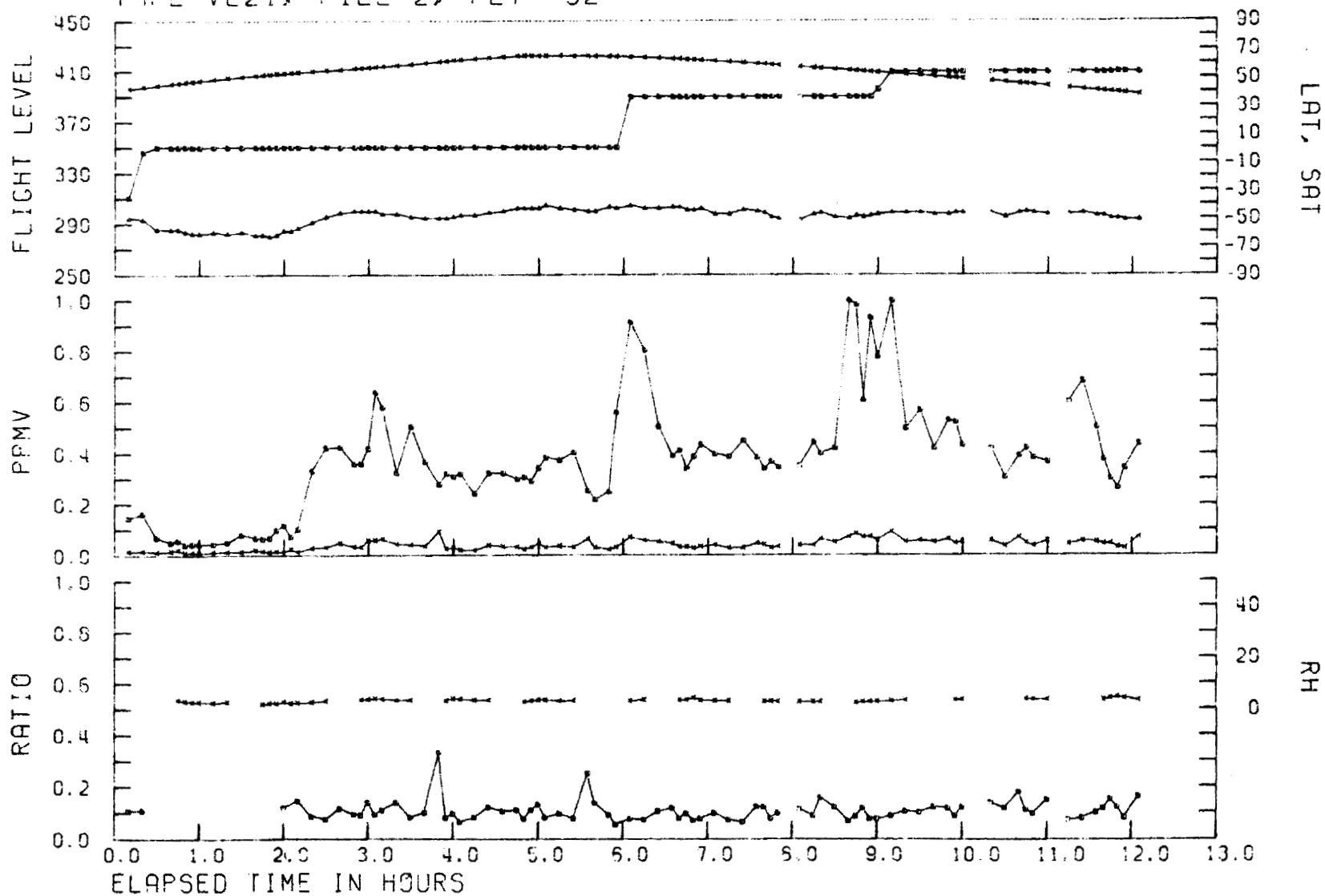


NRT TO JFK DEPARTURE 25 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 51

B-171

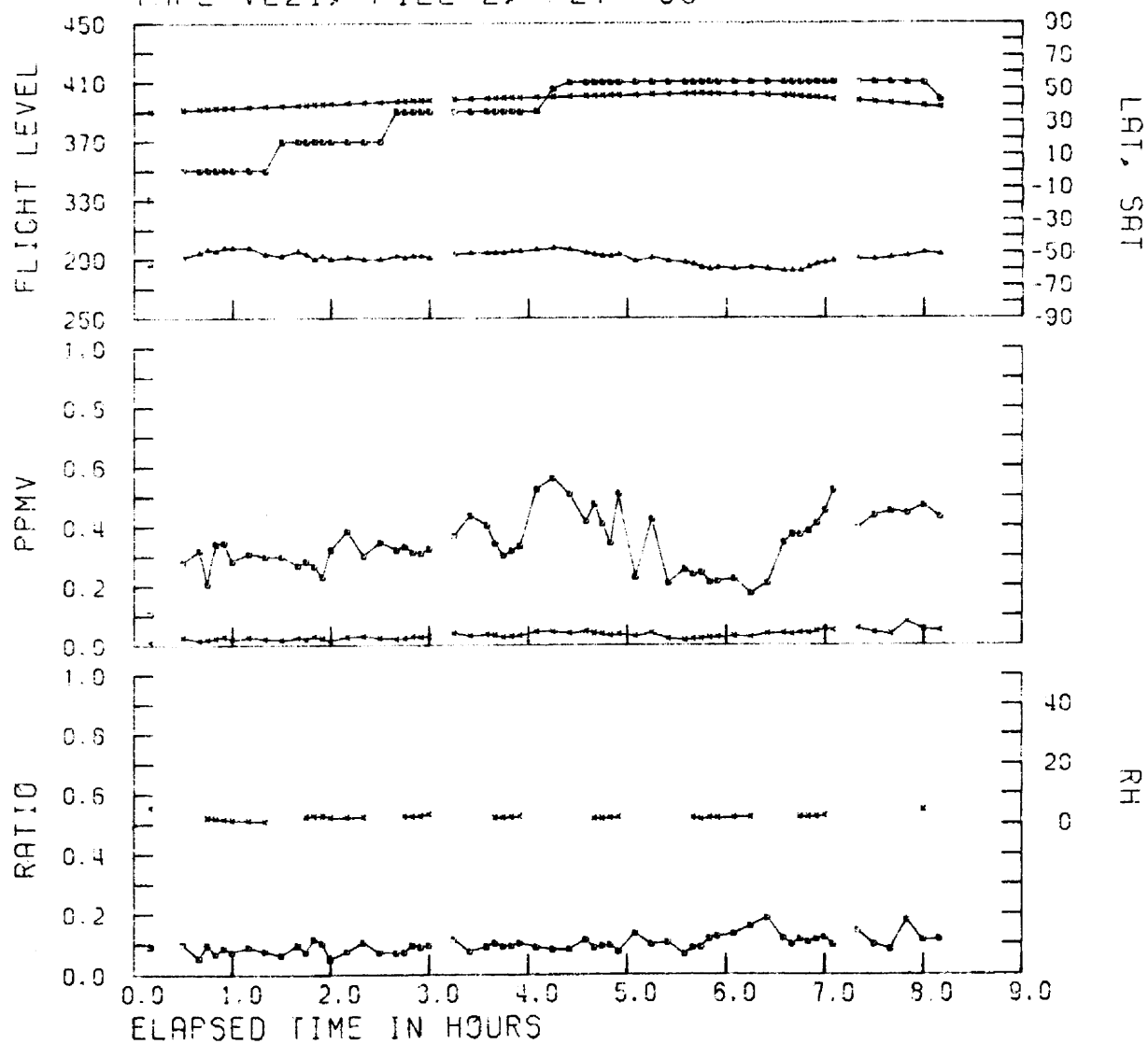


JFK TO NRT DEPARTURE 26 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 52



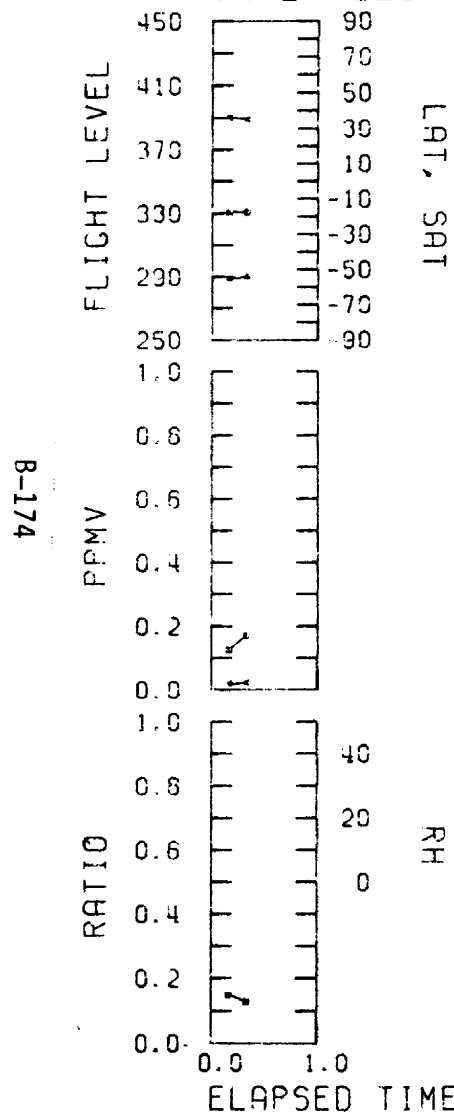
B-172

NRT TO SFO DEPARTURE 27 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 53

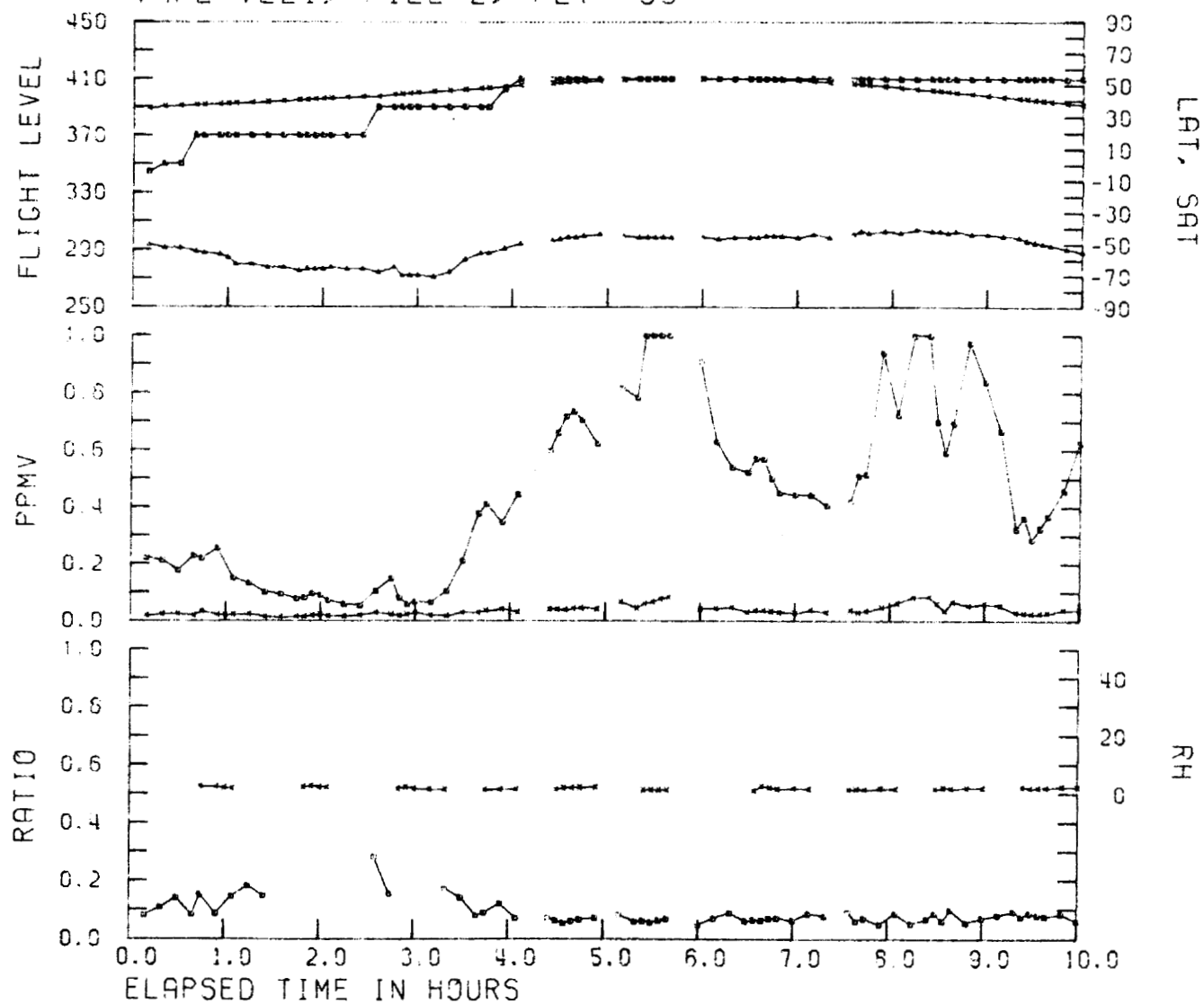


8-173

SFO TO LAX DEPARTURE 27 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 54

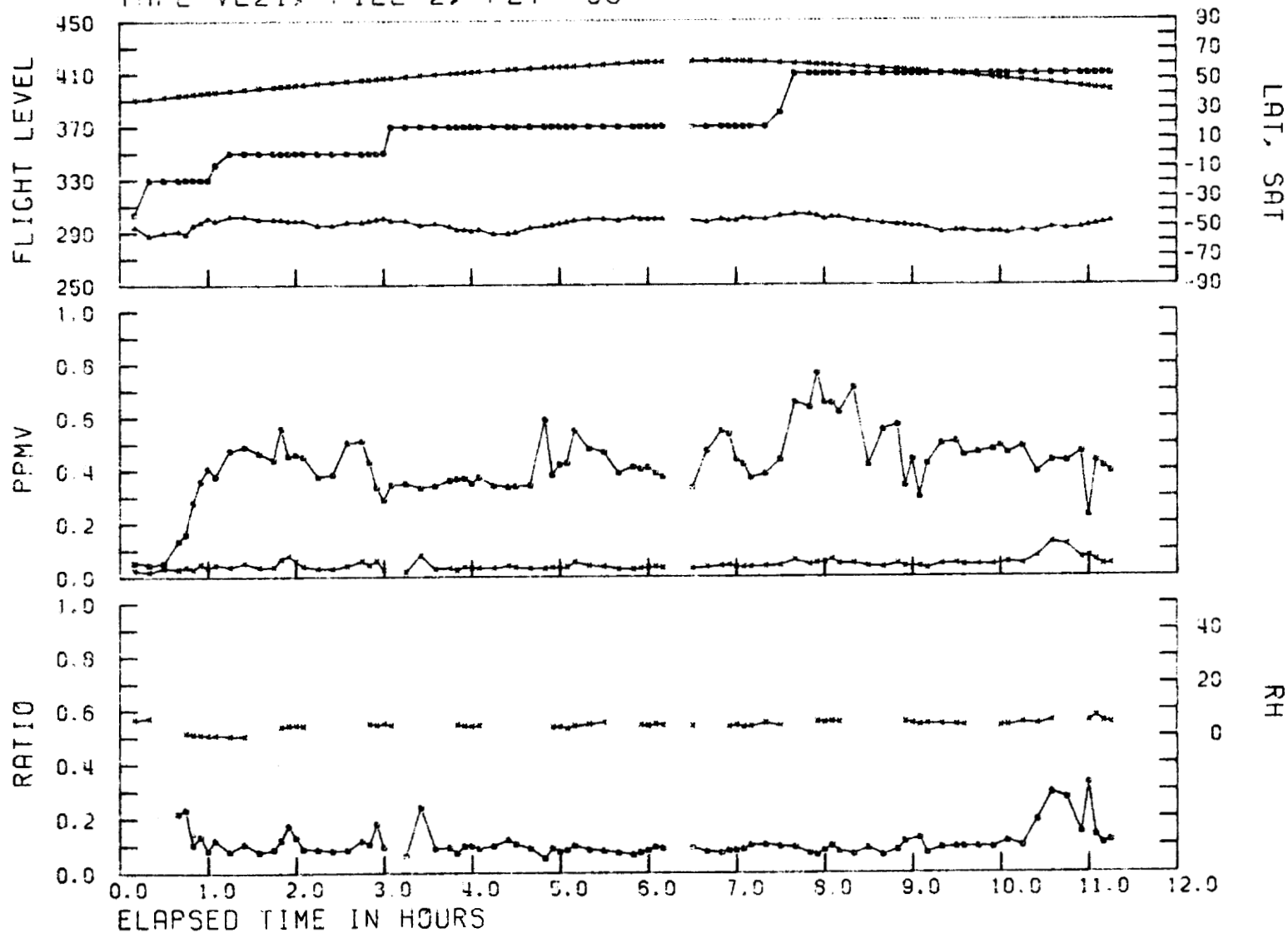


LAX TO NRT DEPARTURE 27 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 55

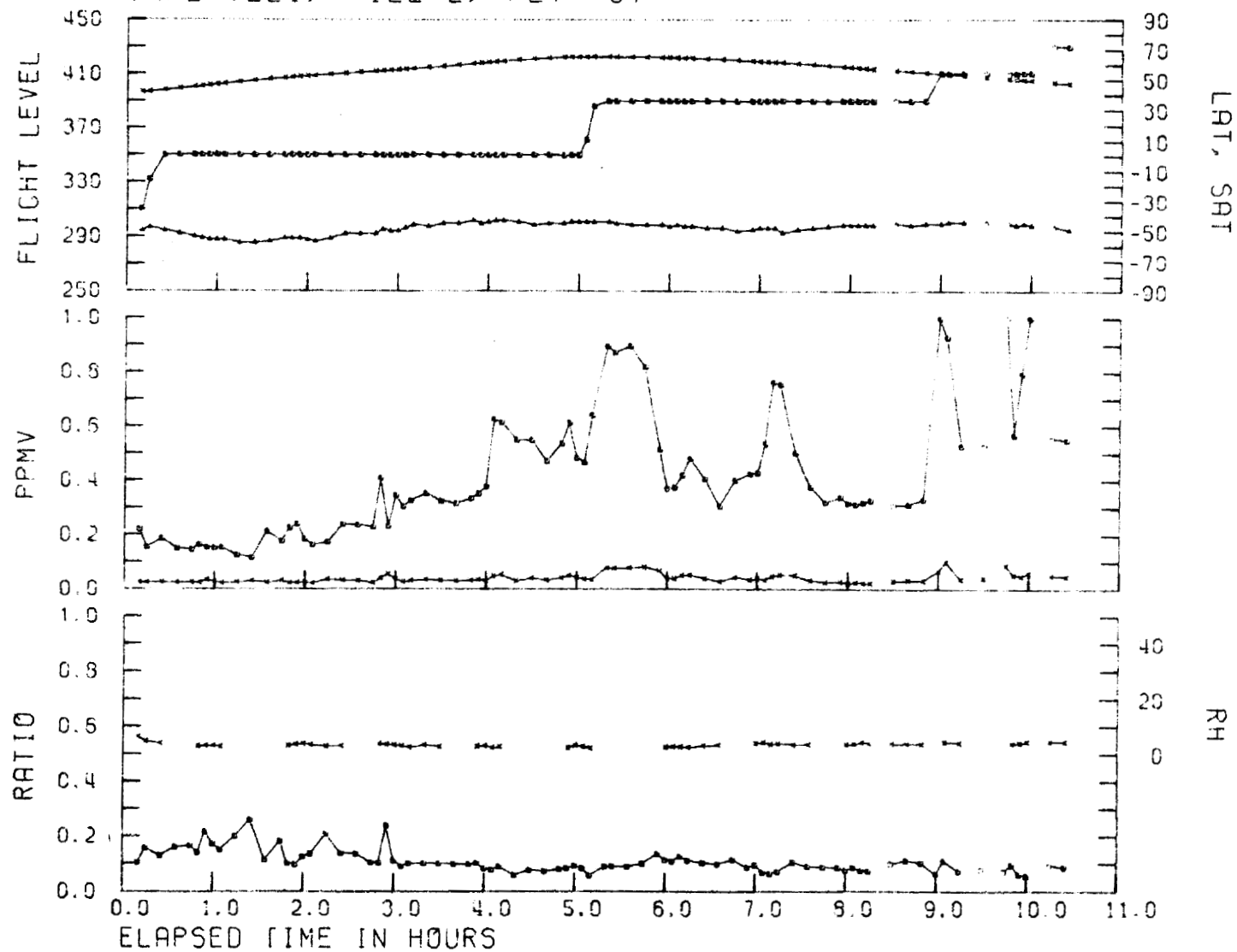


B-175

NRT TO JFK DEPARTURE 28 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 56

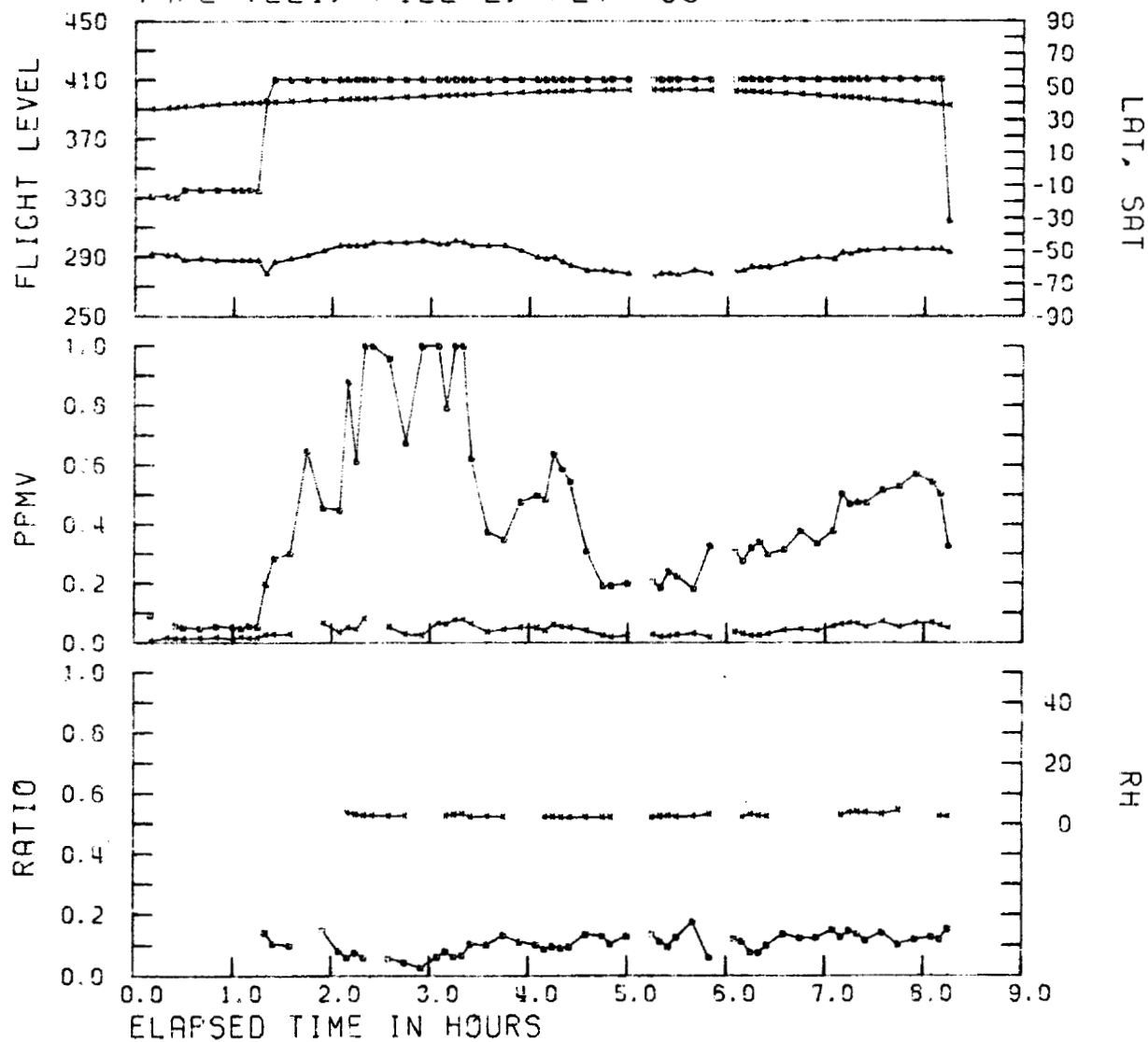


JFK TO NRT DEPARTURE 29 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 57



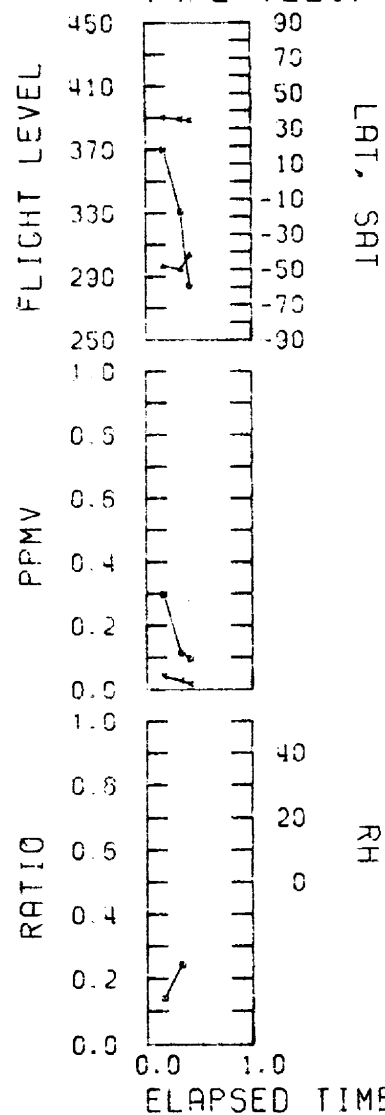
B-177

NRT TO SFO DEPARTURE 30 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 58

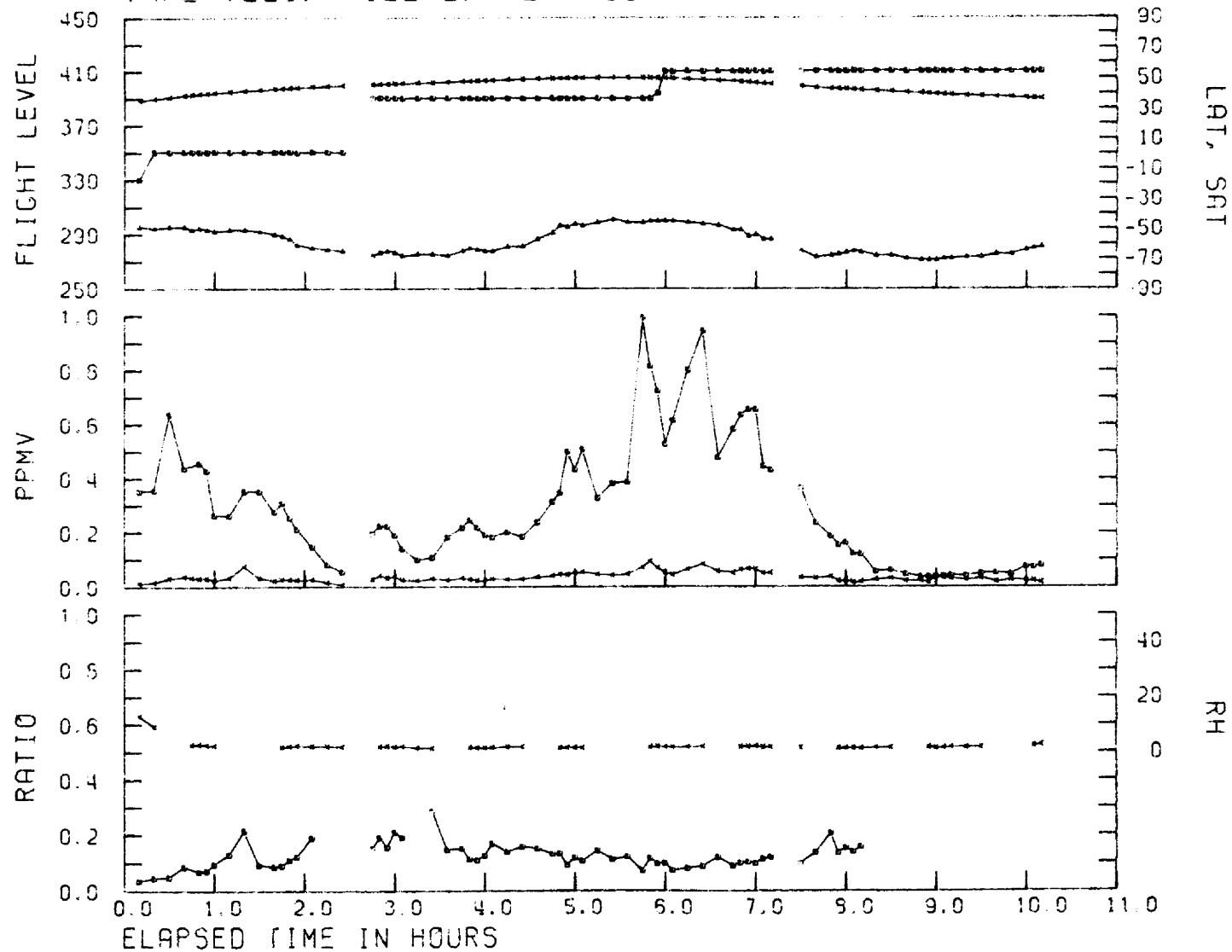


B-178

SFO TO LAX DEPARTURE 31 JAN 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 59



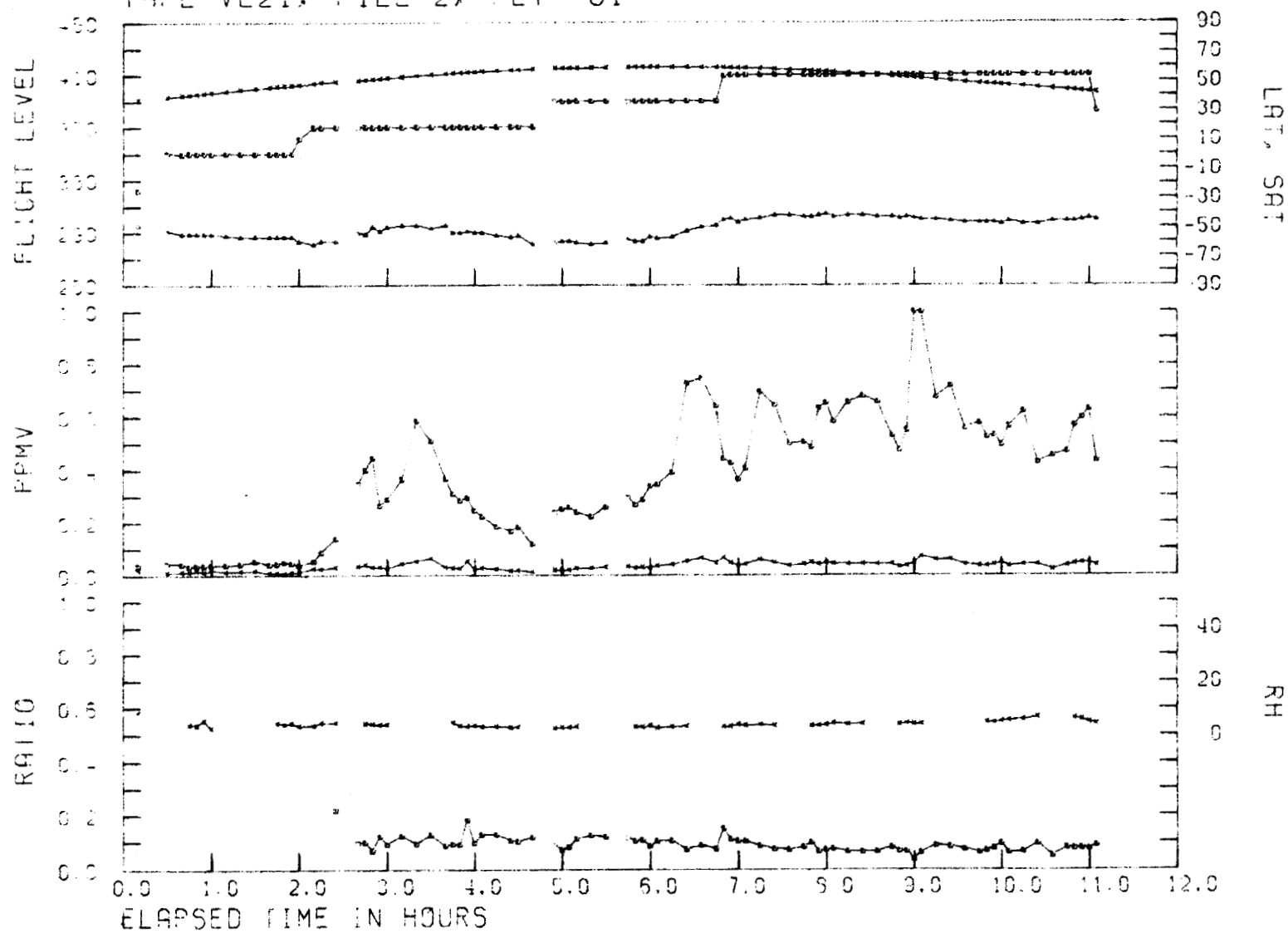
LAX TO NRT DEPARTURE 31 JAN 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 60



B-180

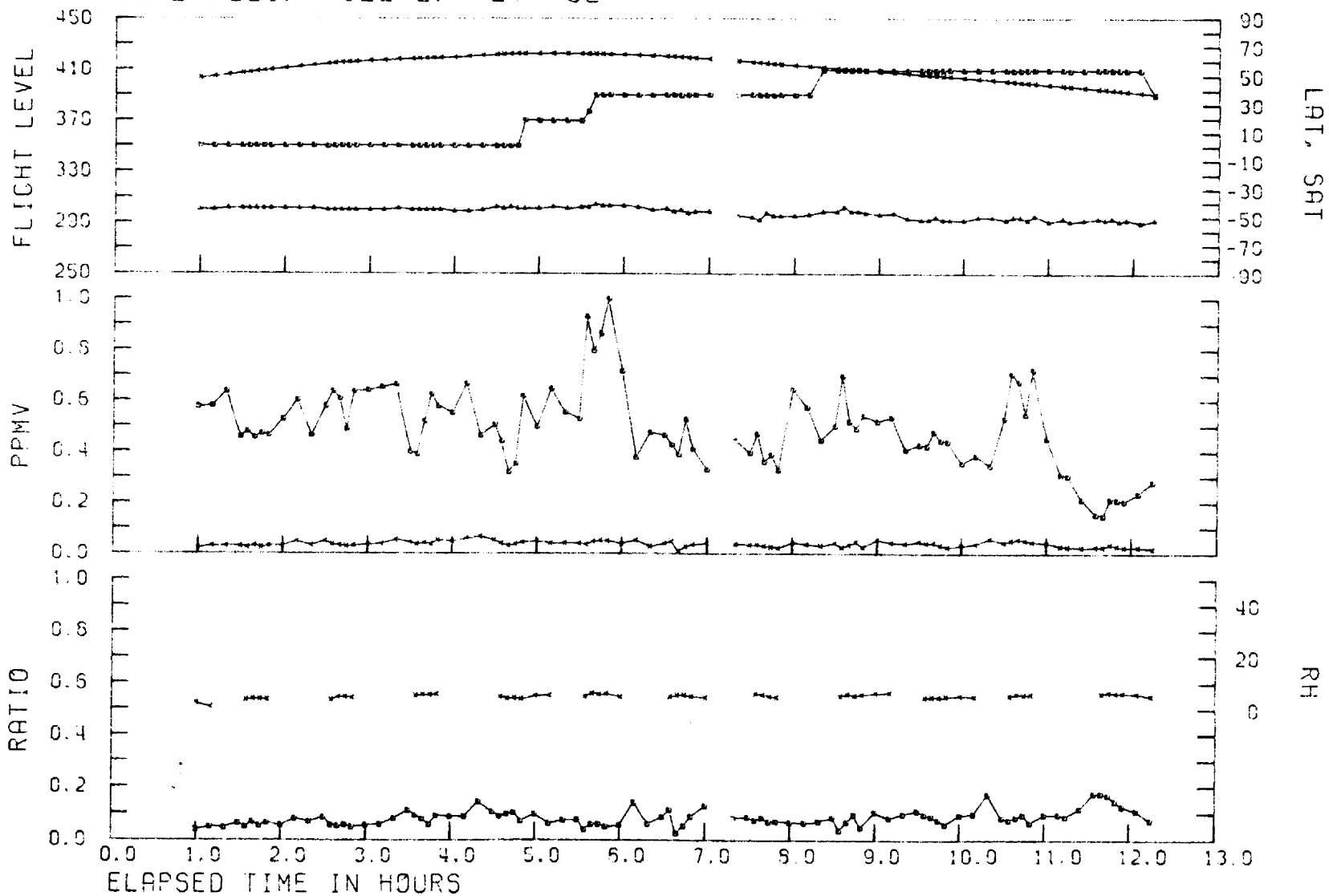
NRT TO JFK DEPARTURE 1 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 61

B-181

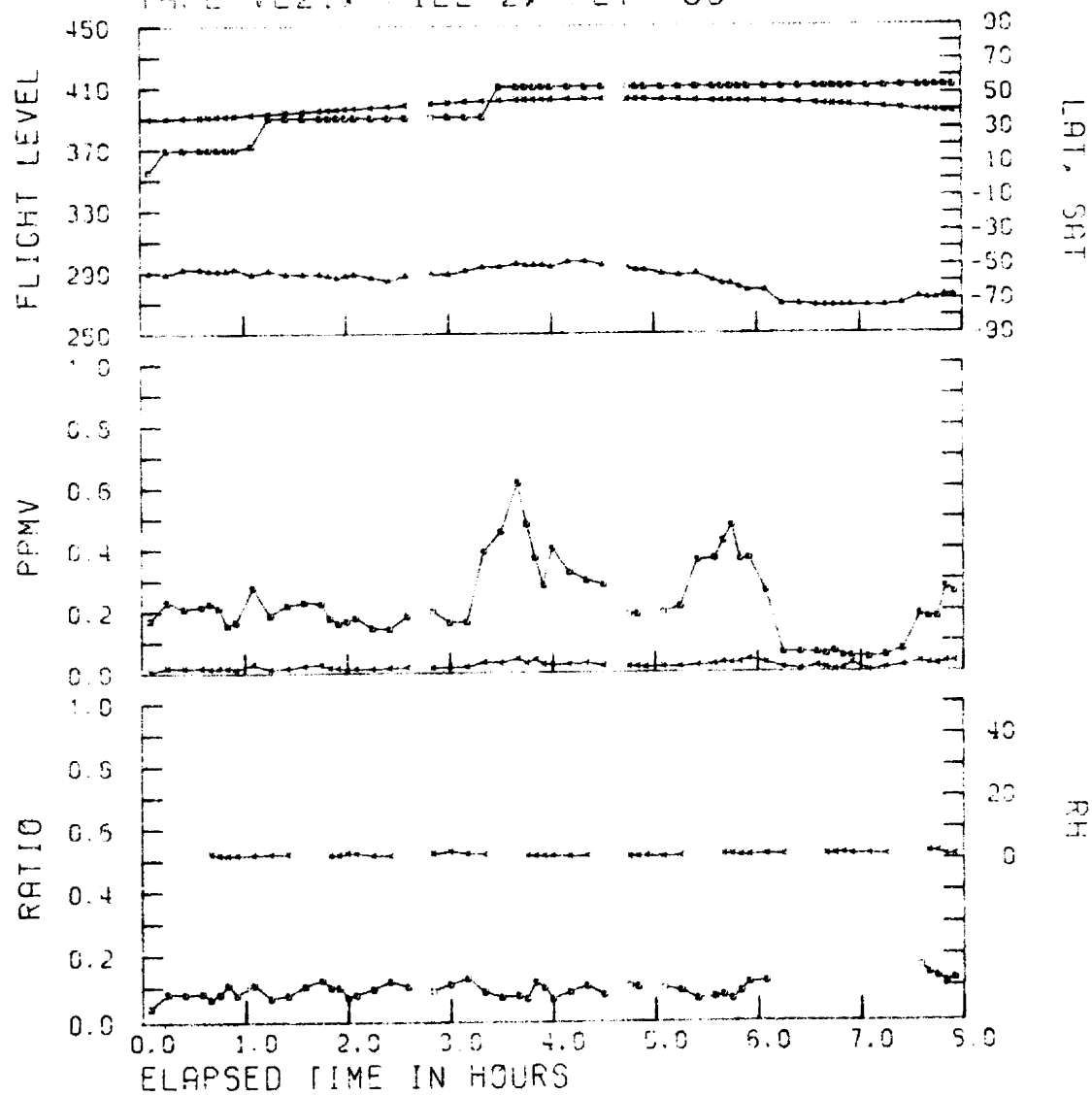


JFK TO NRT DEPARTURE 3 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 62

8-182



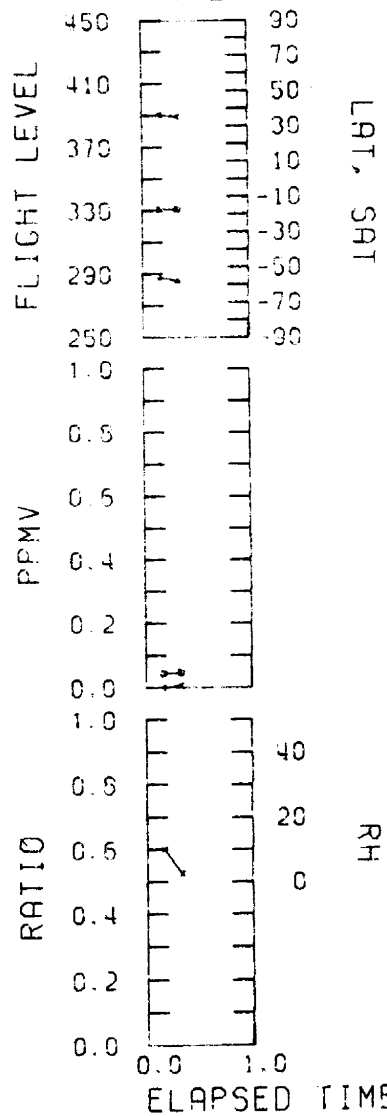
NRT TO SFO DEPARTURE 4 FEB 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 63



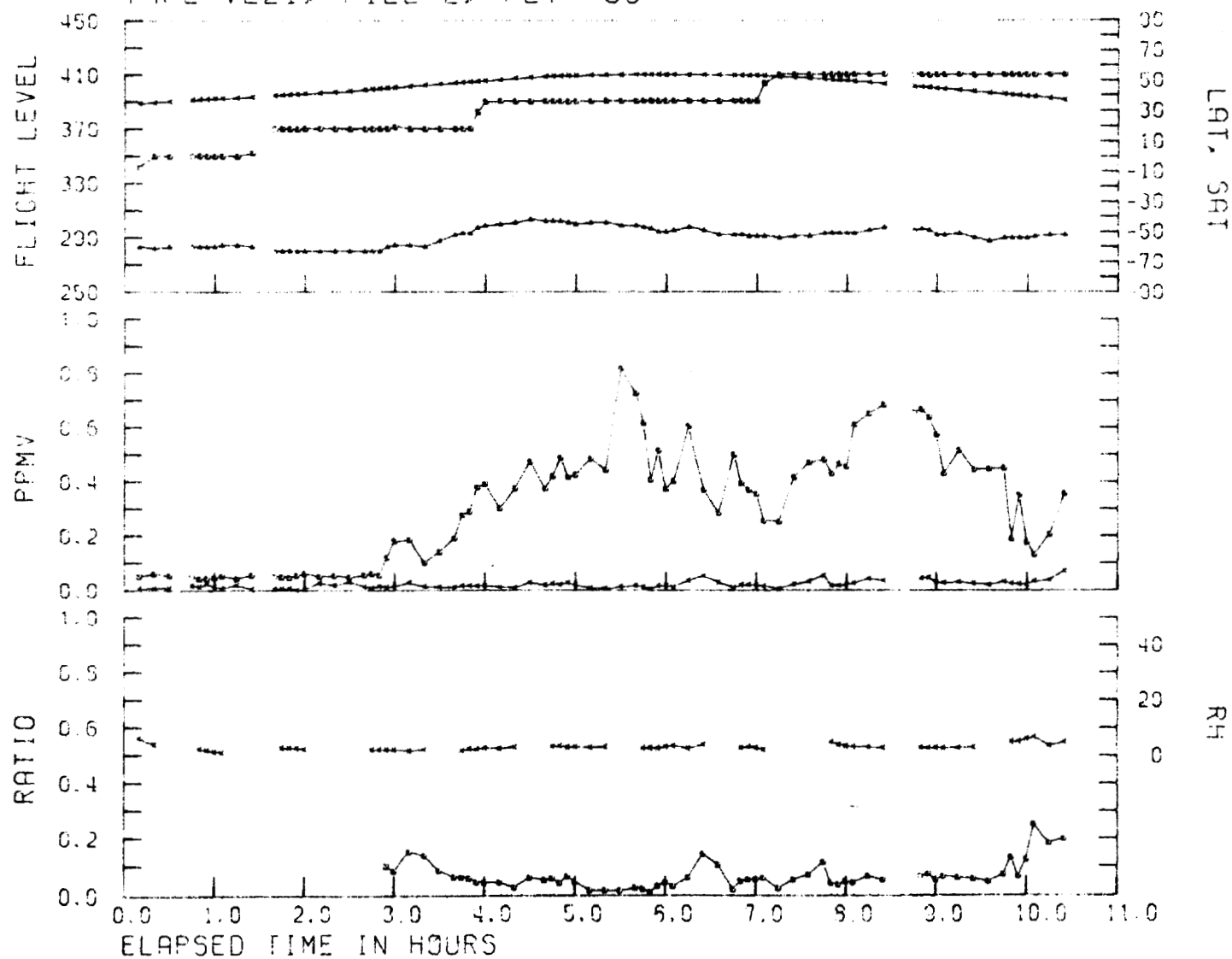
B-183

SFO TO LAX DEPARTURE 4 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 64

B-184



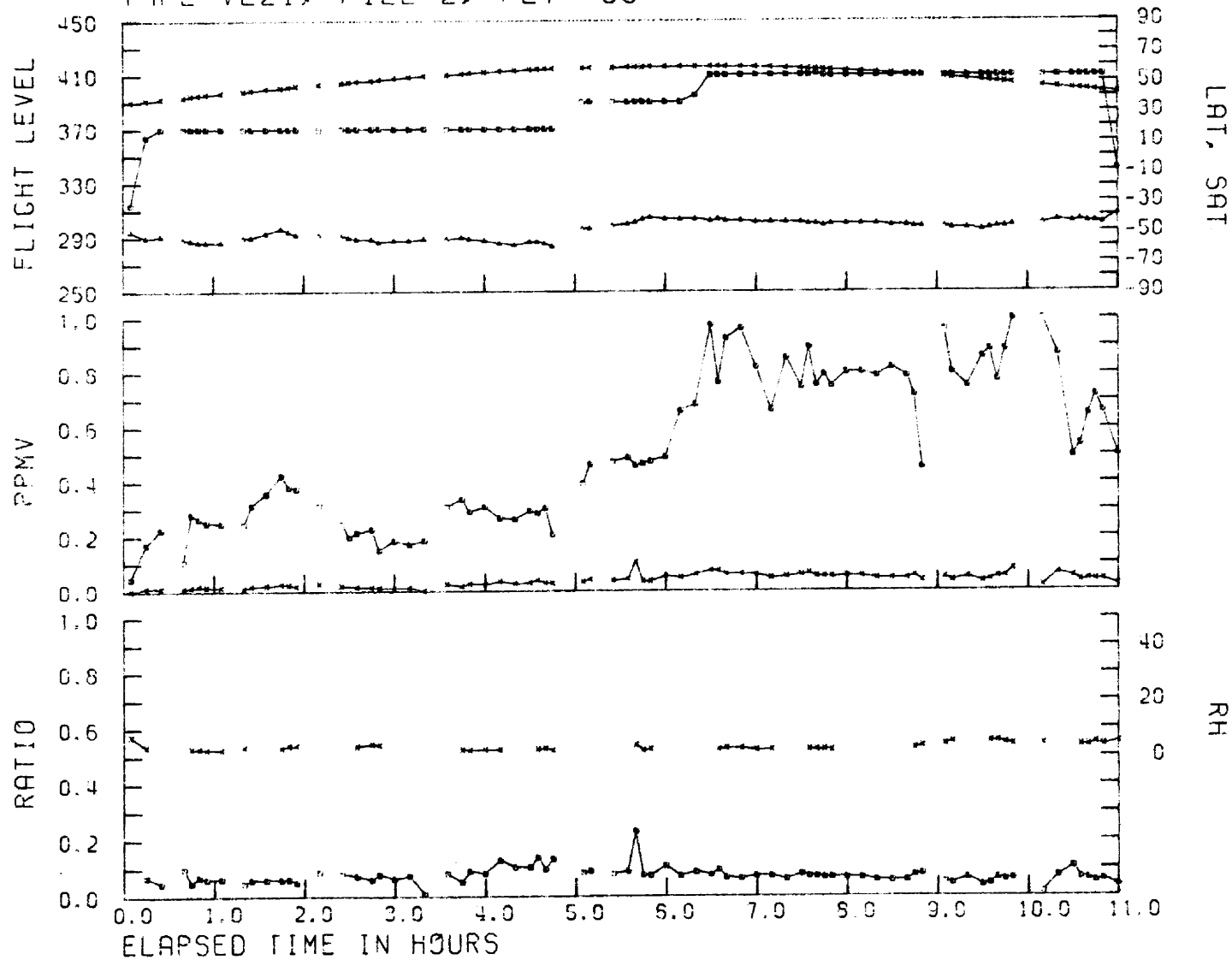
LAX TO NRT DEPARTURE 4 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 65



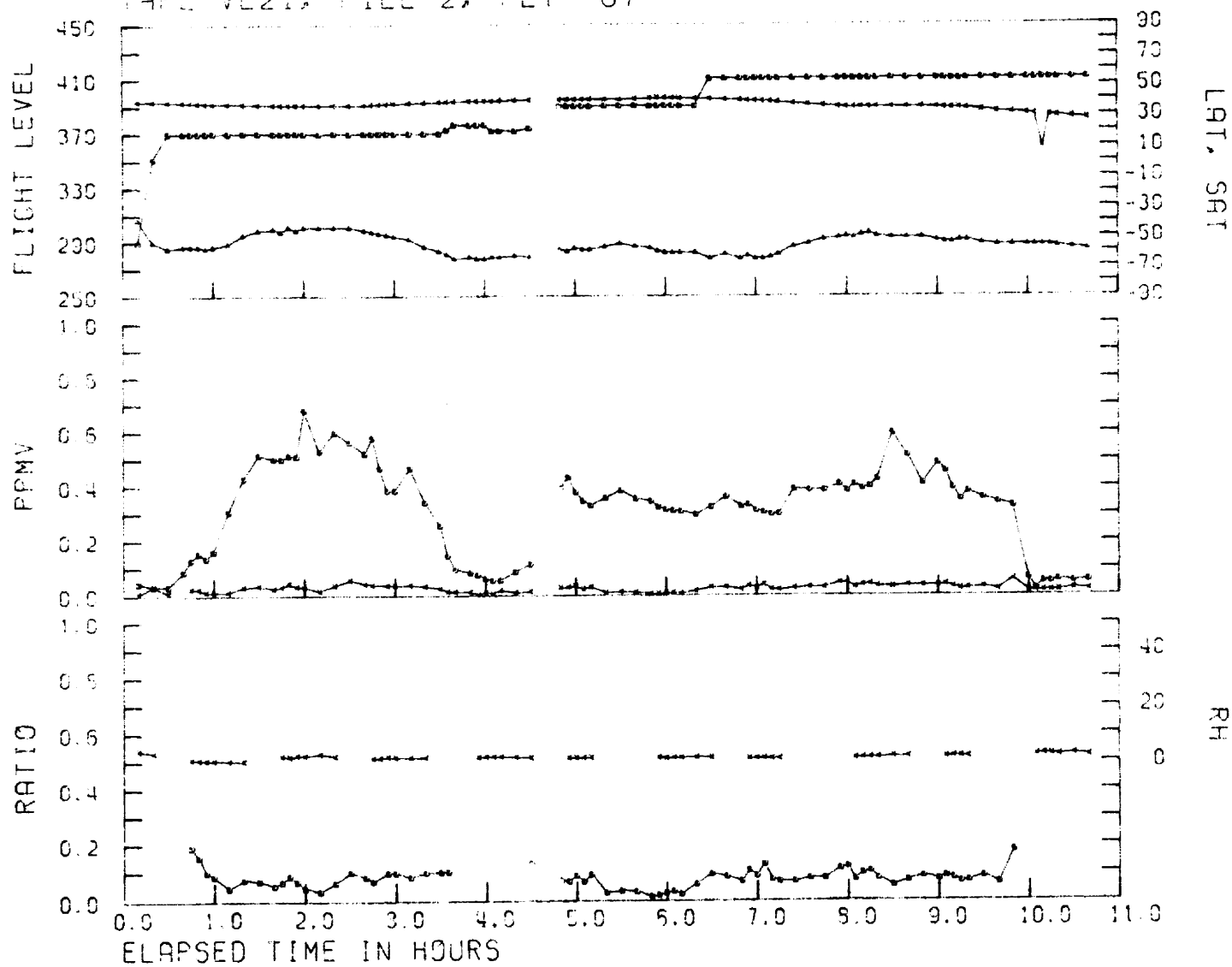
8-185

NRT TO JFK DEPARTURE 5 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 66

B-186

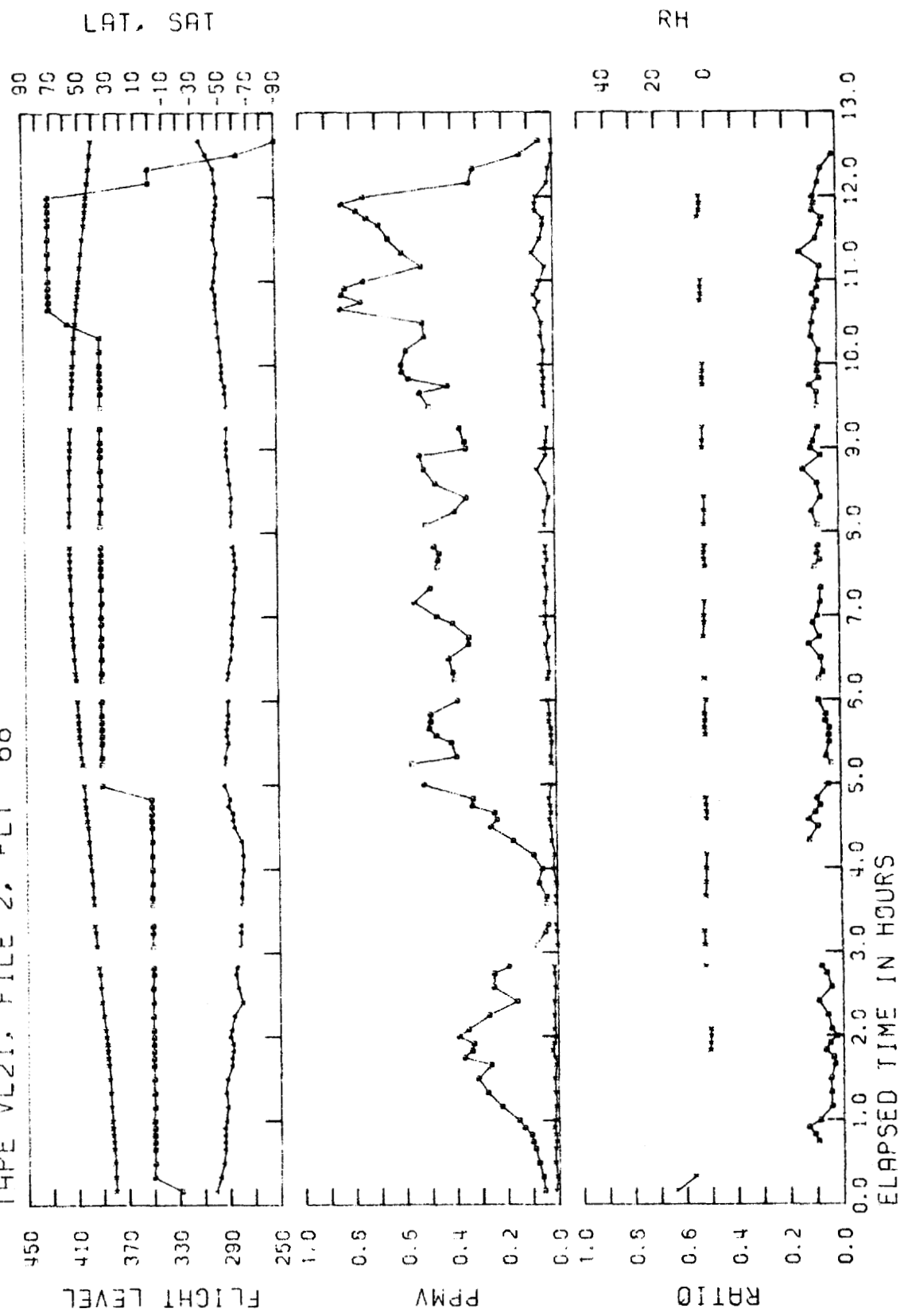


JFK TO DHA DEPARTURE 7 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 67



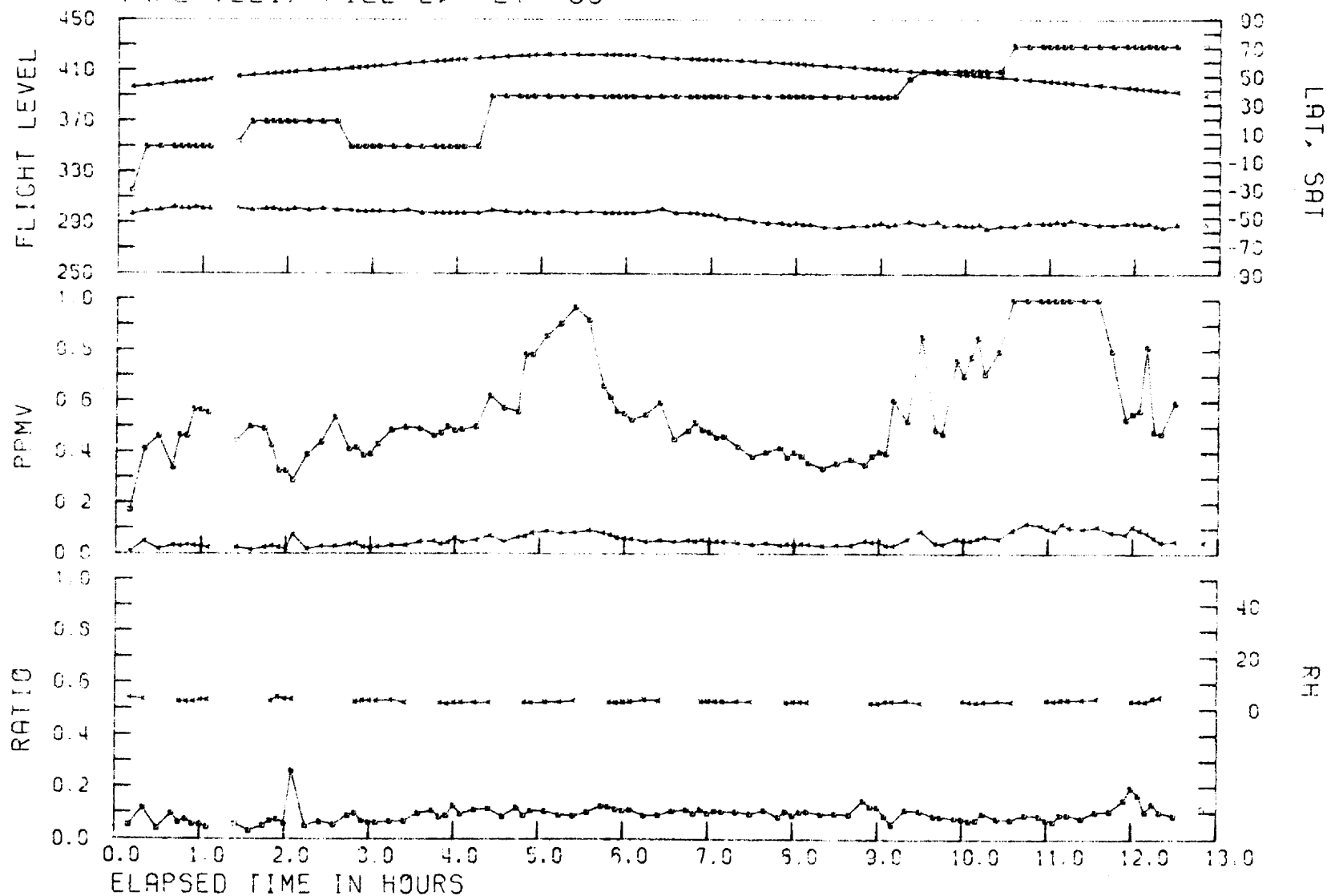
B-187

DH9 TO JFK DEPARTURE 7 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 68



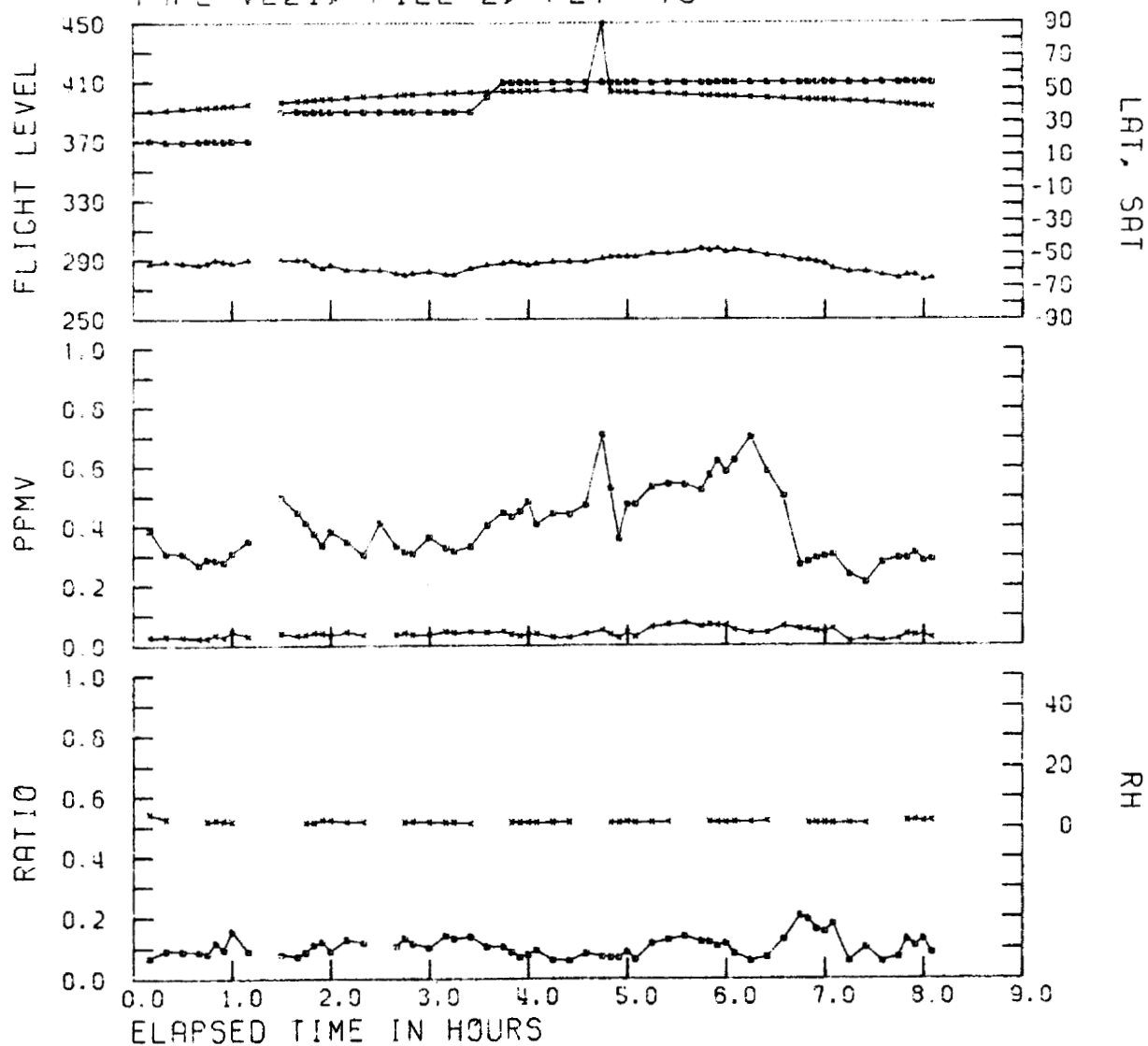
JFK TO NRT DEPARTURE 8 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 69

B-189

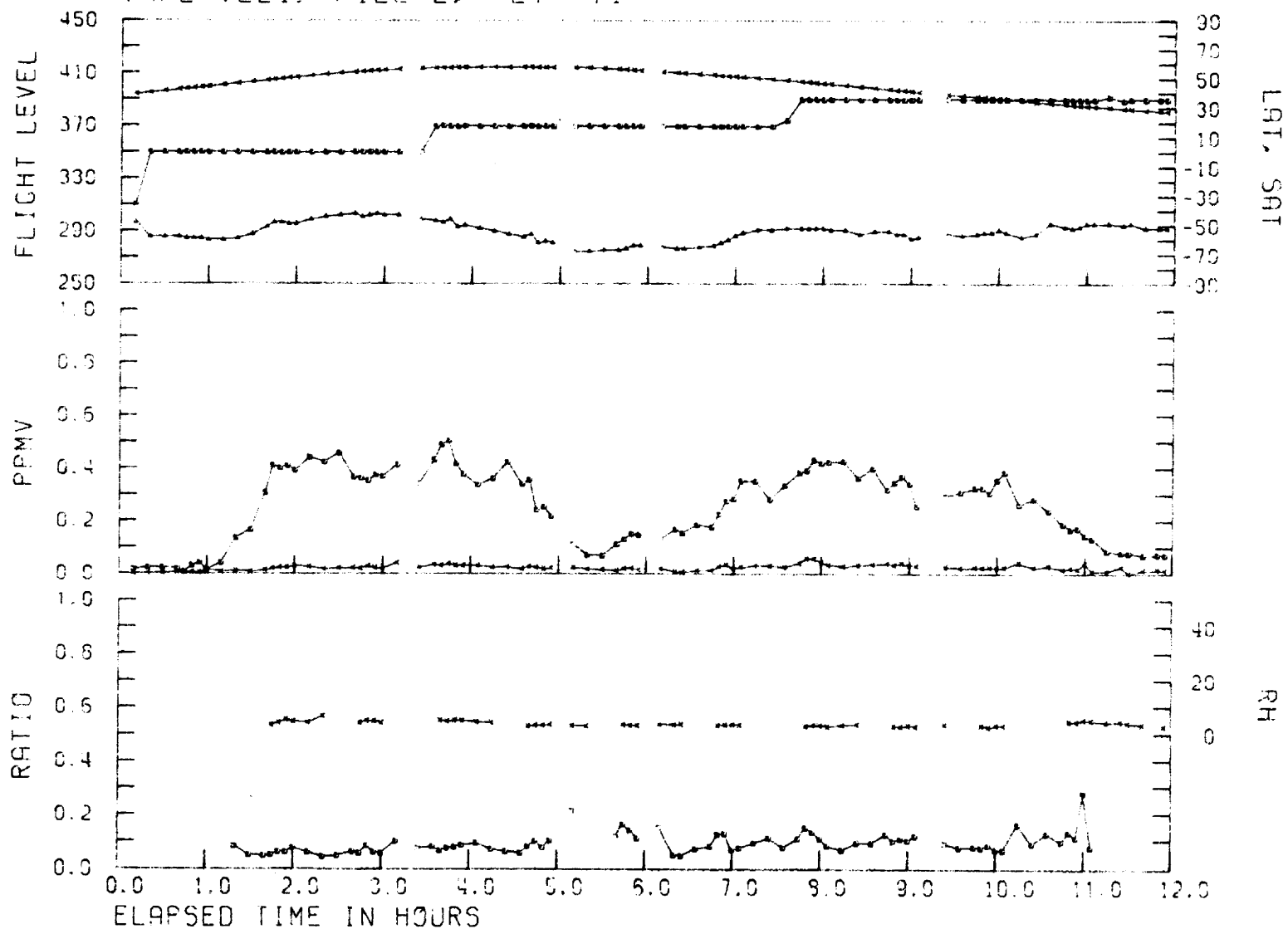


NRT TO SFO DEPARTURE 9 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 70

B-190



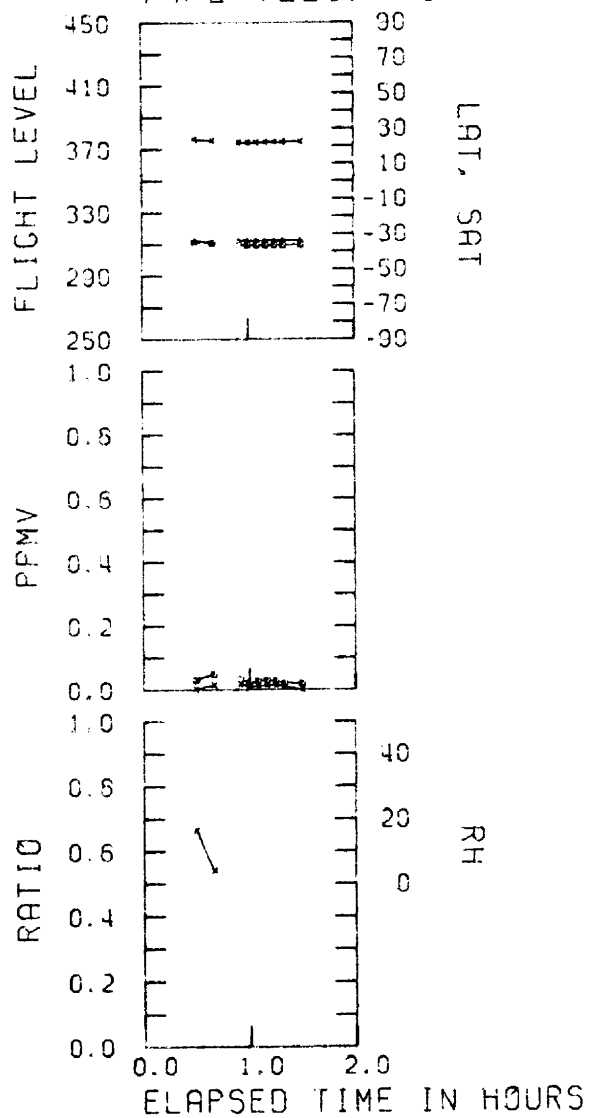
SFO TO OKA DEPARTURE 9 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 71



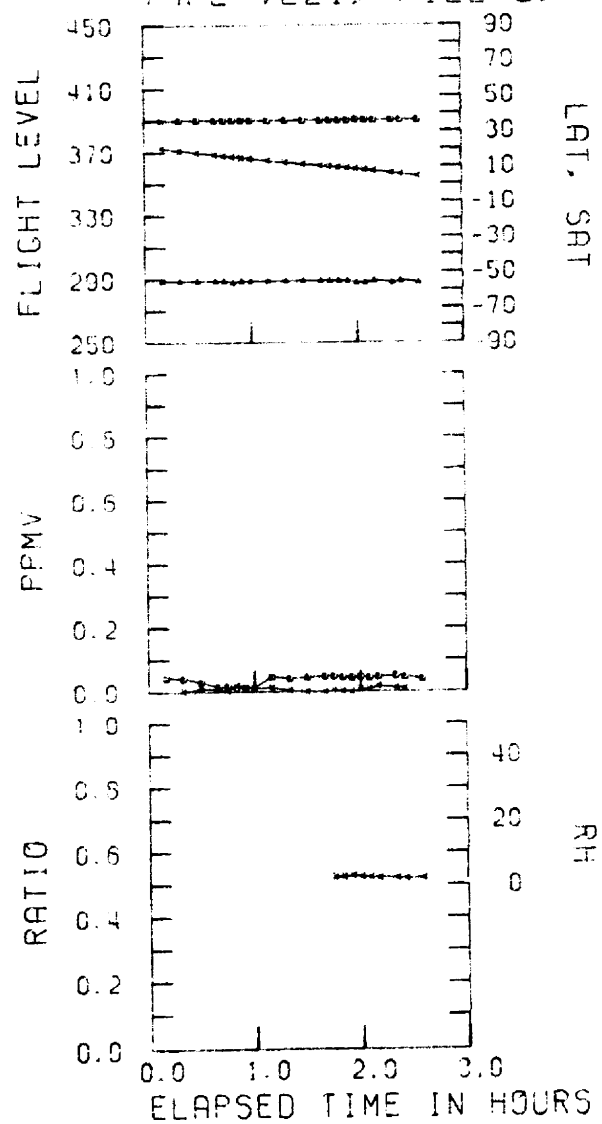
B-191

OKA TO HKG DEPARTURE 10 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 72

B-192

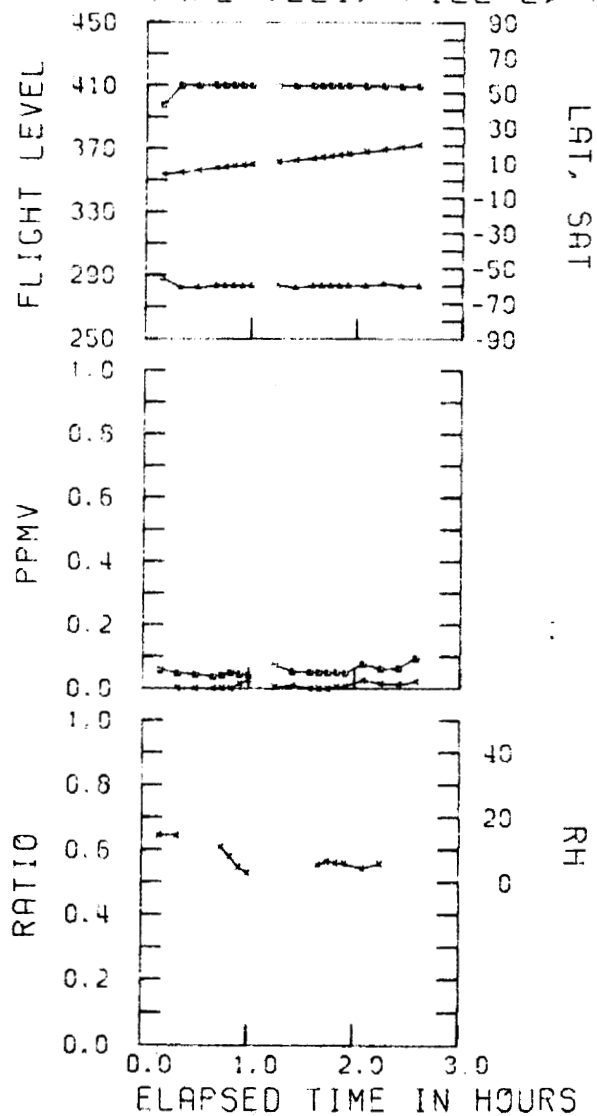


HKG TO SIN DEPARTURE 10 FEB 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 73

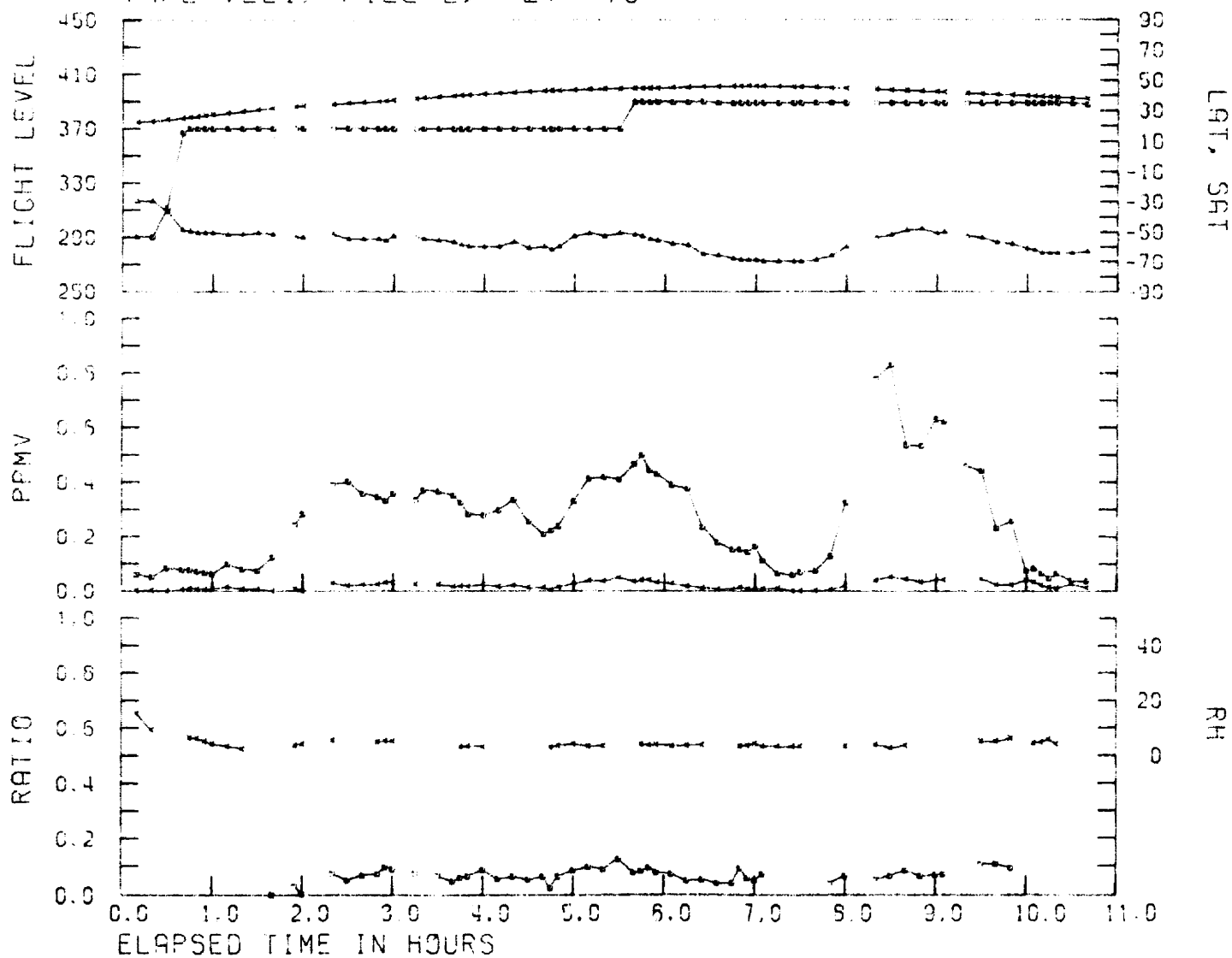


B-193

SIN TO HKG DEPARTURE 11 FEB 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 74

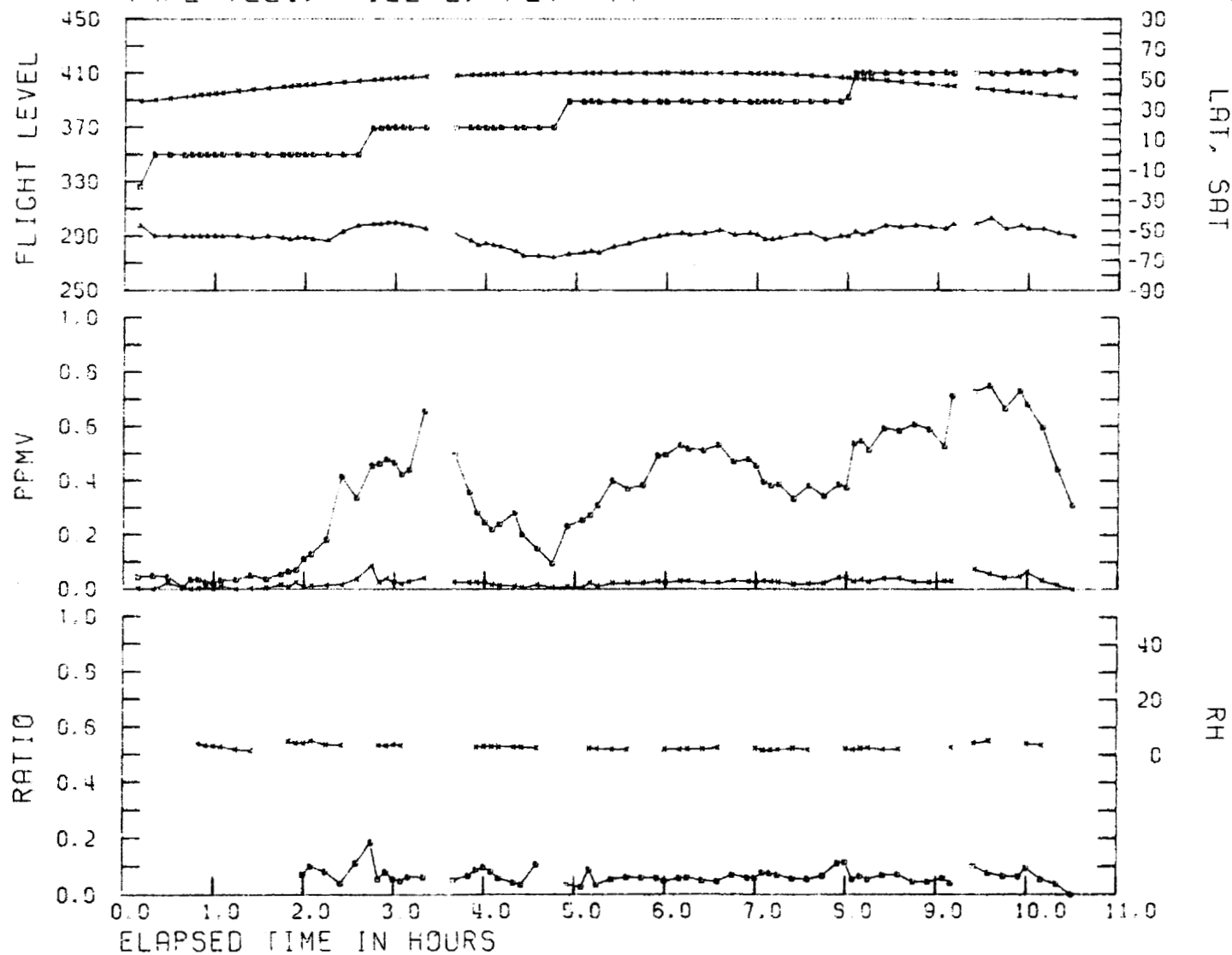


HKG TO SFO DEPARTURE 11 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 75



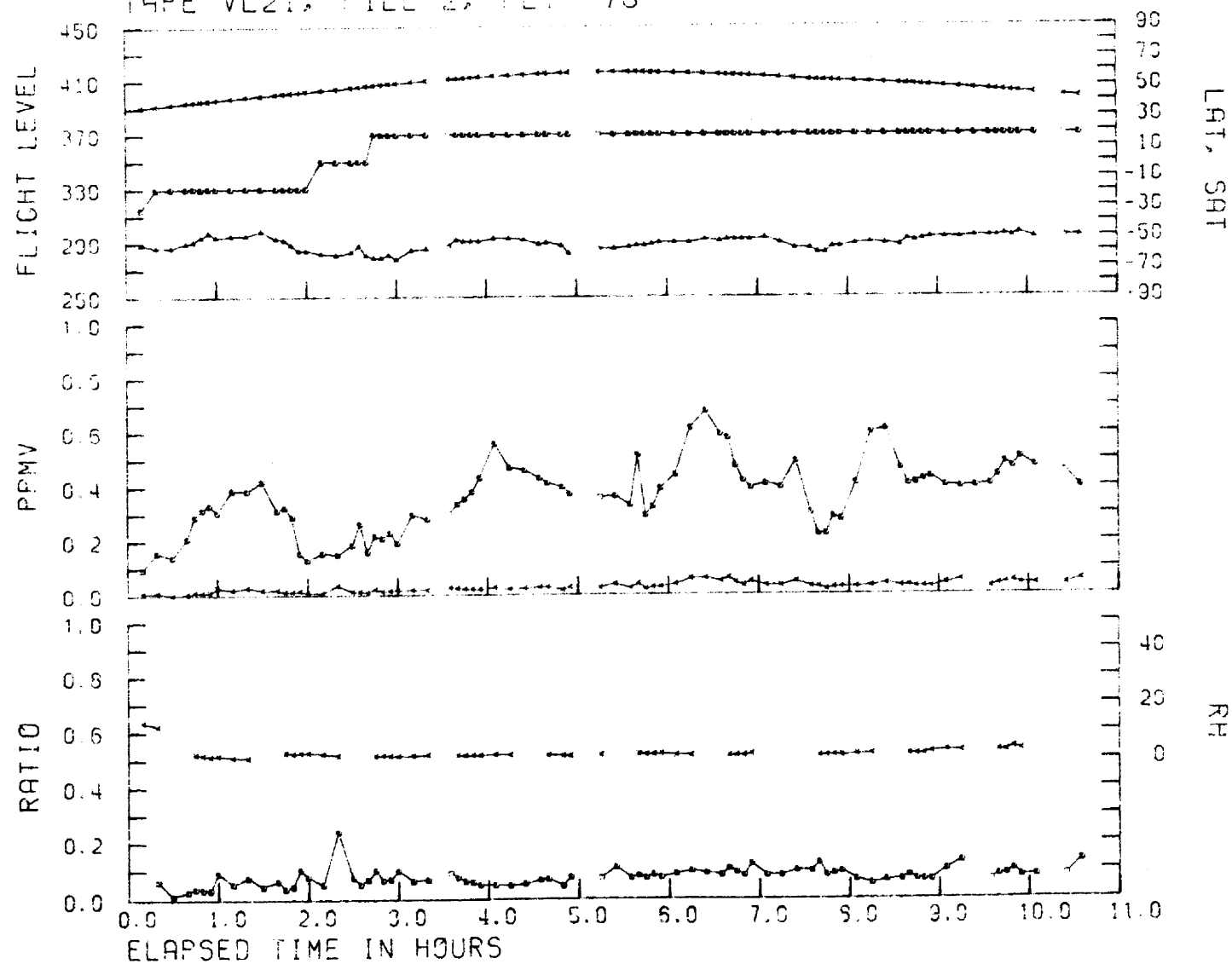
B-195

LAX TO NRT DEPARTURE 11 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 77



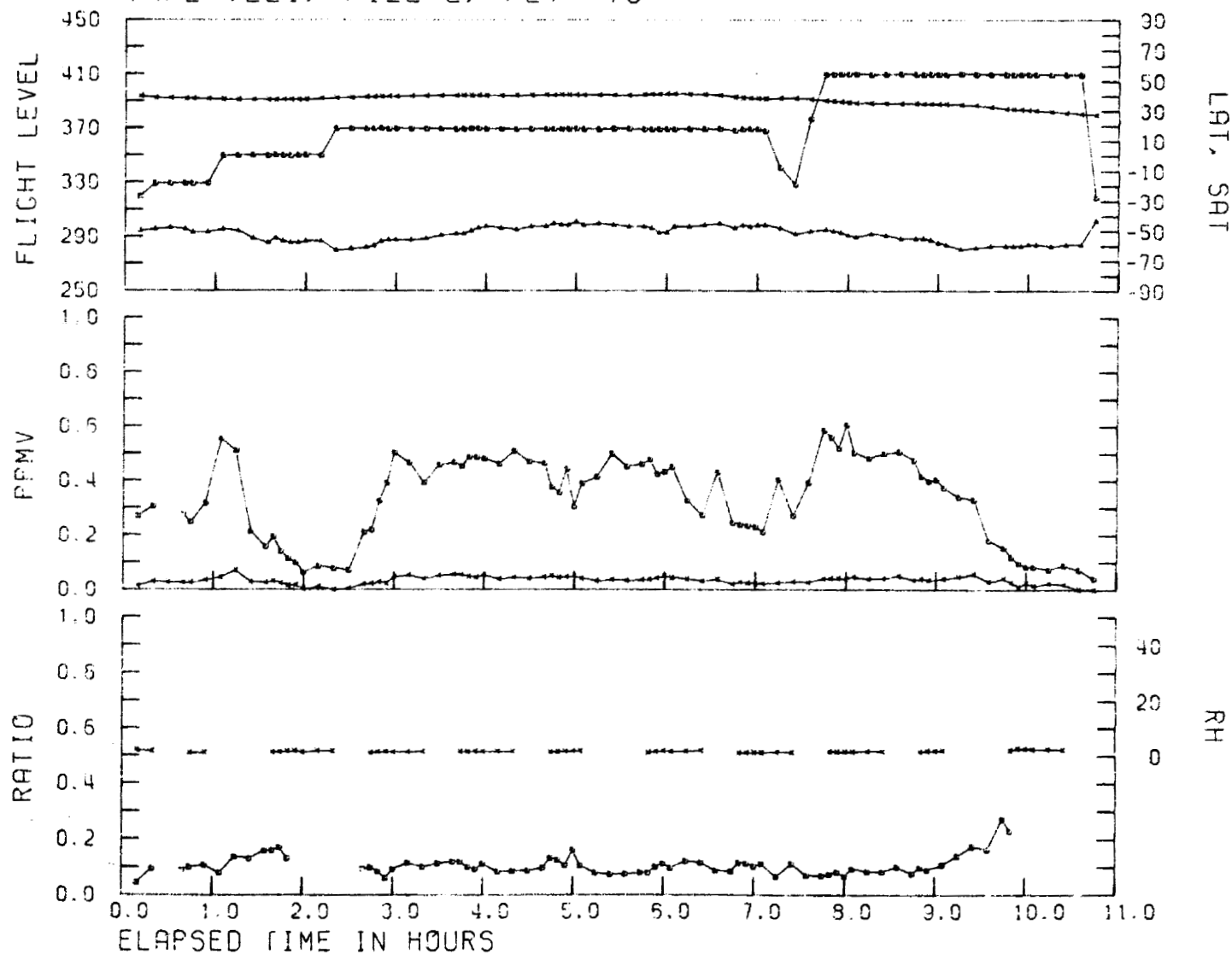
B-196

NRT TO JFK DEPARTURE 12 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 78



B-197

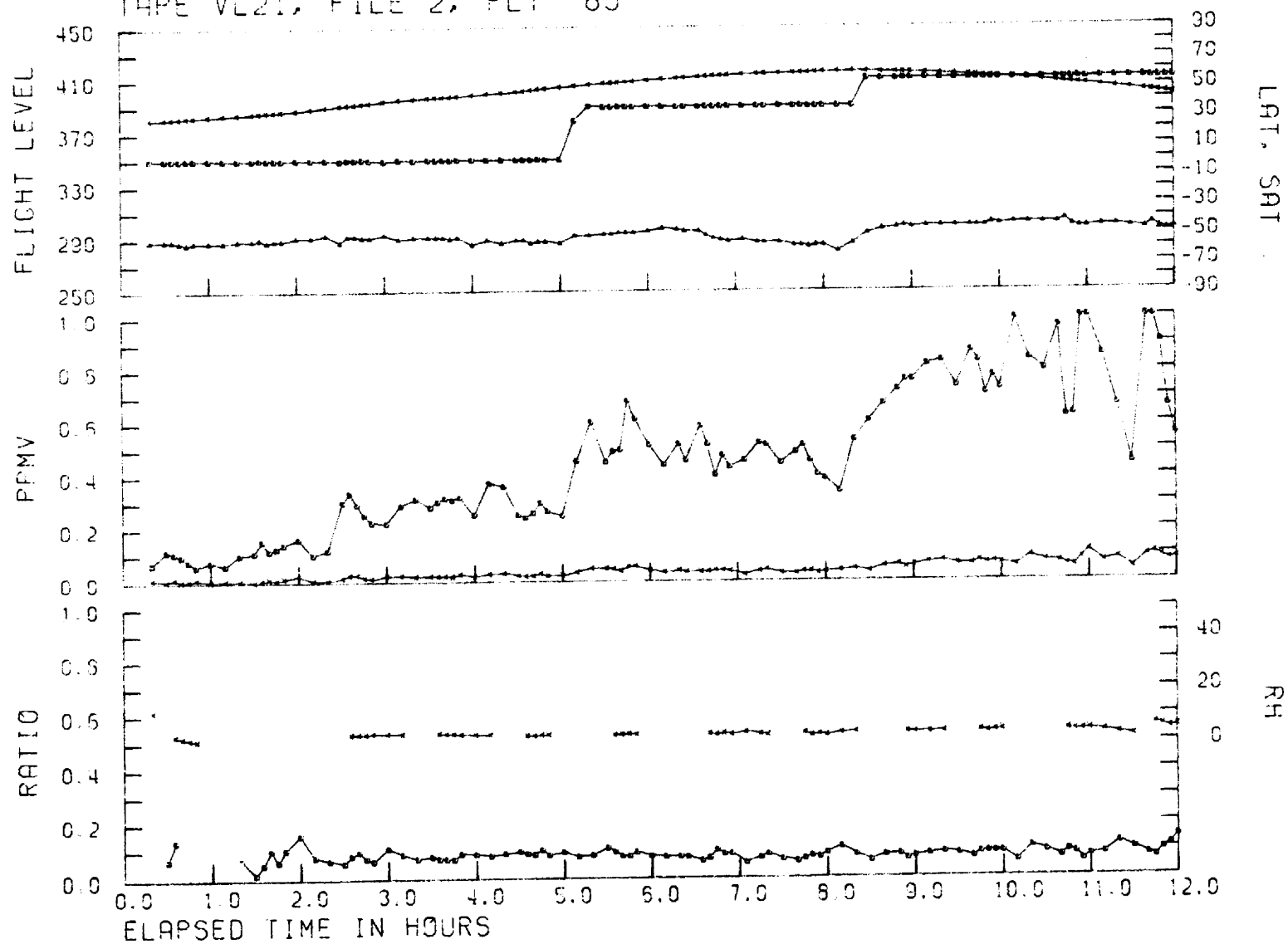
JFK TO DHA DEPARTURE 14 FEB 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 79



B-198

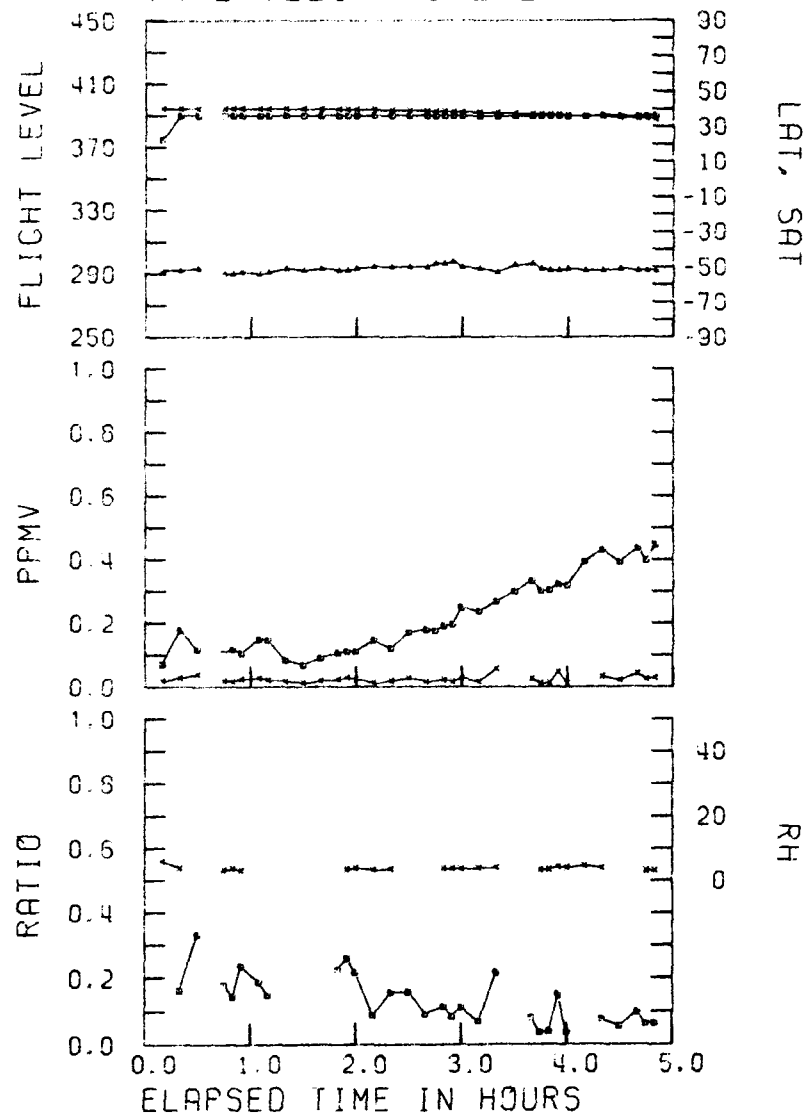
DHA TO JFK DEPARTURE 14 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 89

B-199

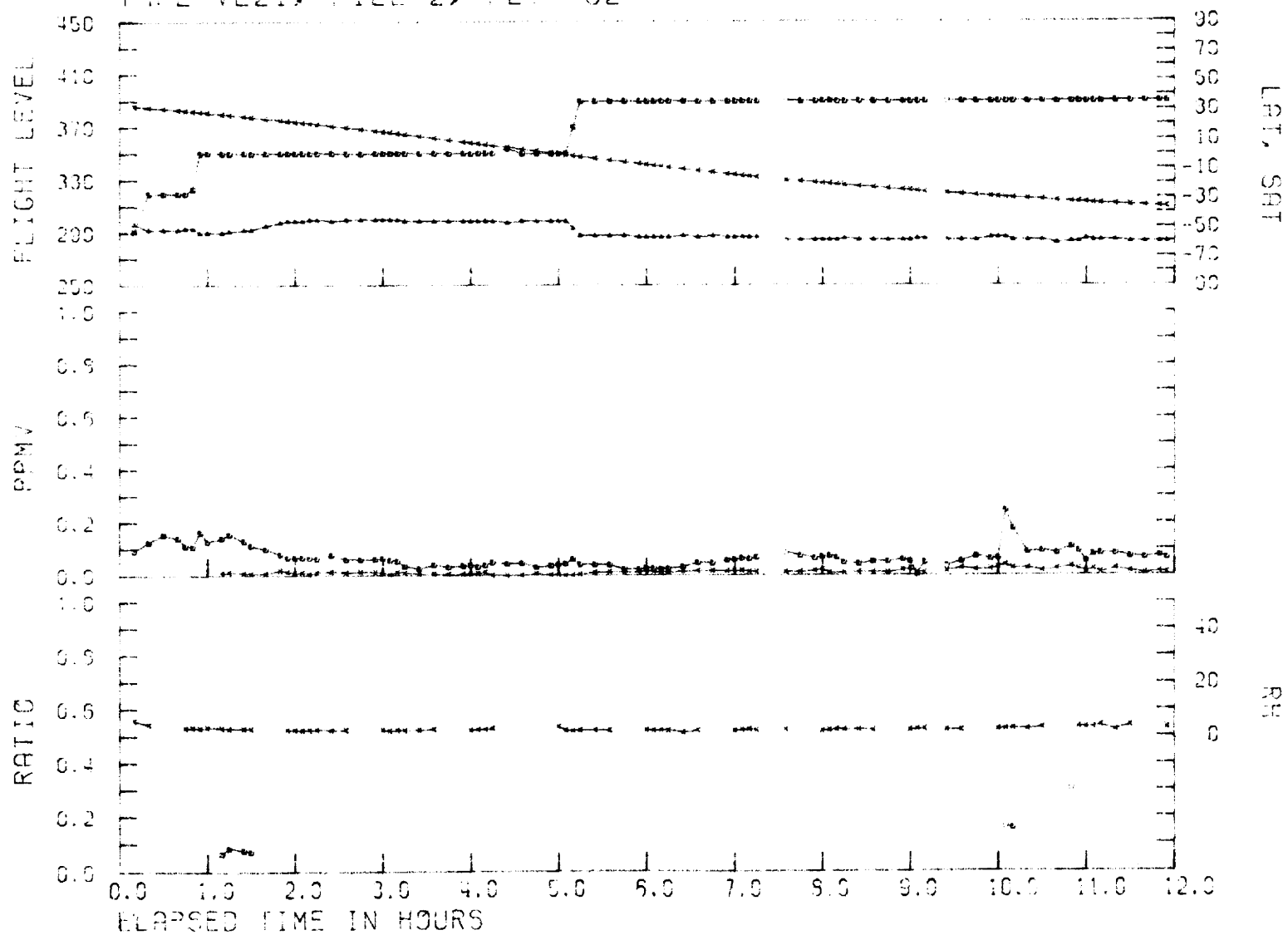


JFK TO LAX DEPARTURE 16 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 81

B-200

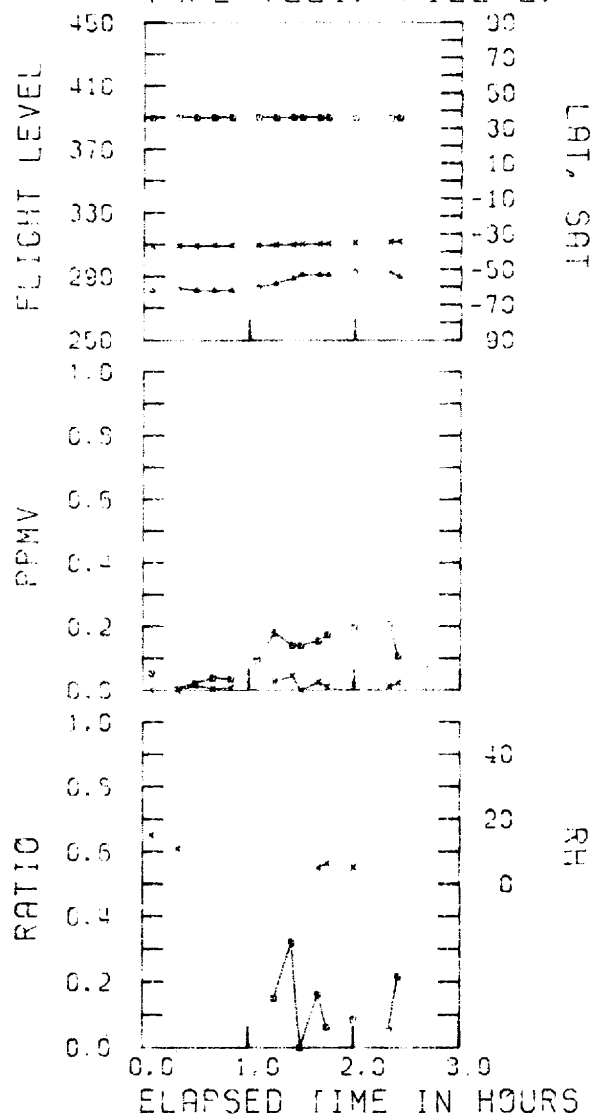


LAX TO AKL DEPARTURE 16 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 82



B-201

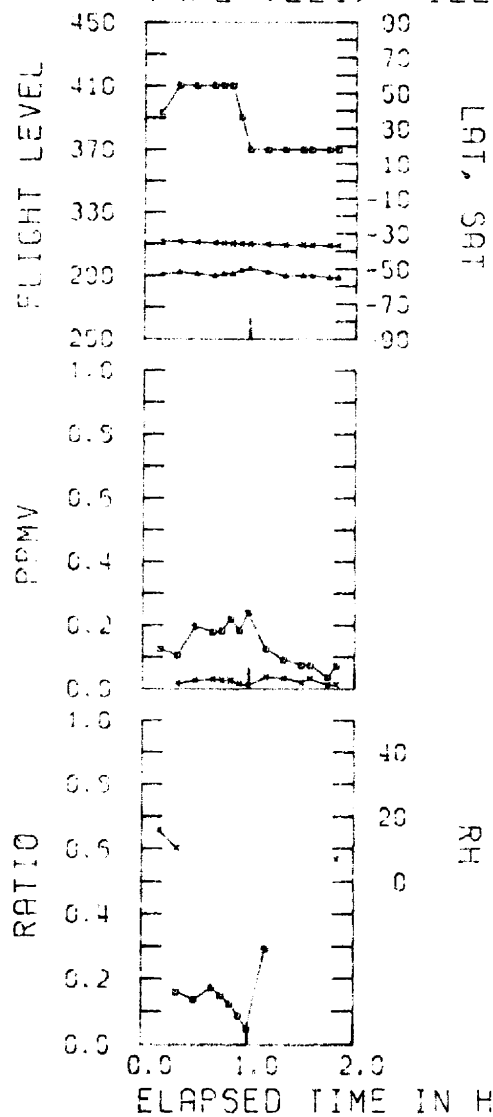
AKL TO SYD DEPARTURE 16 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 83



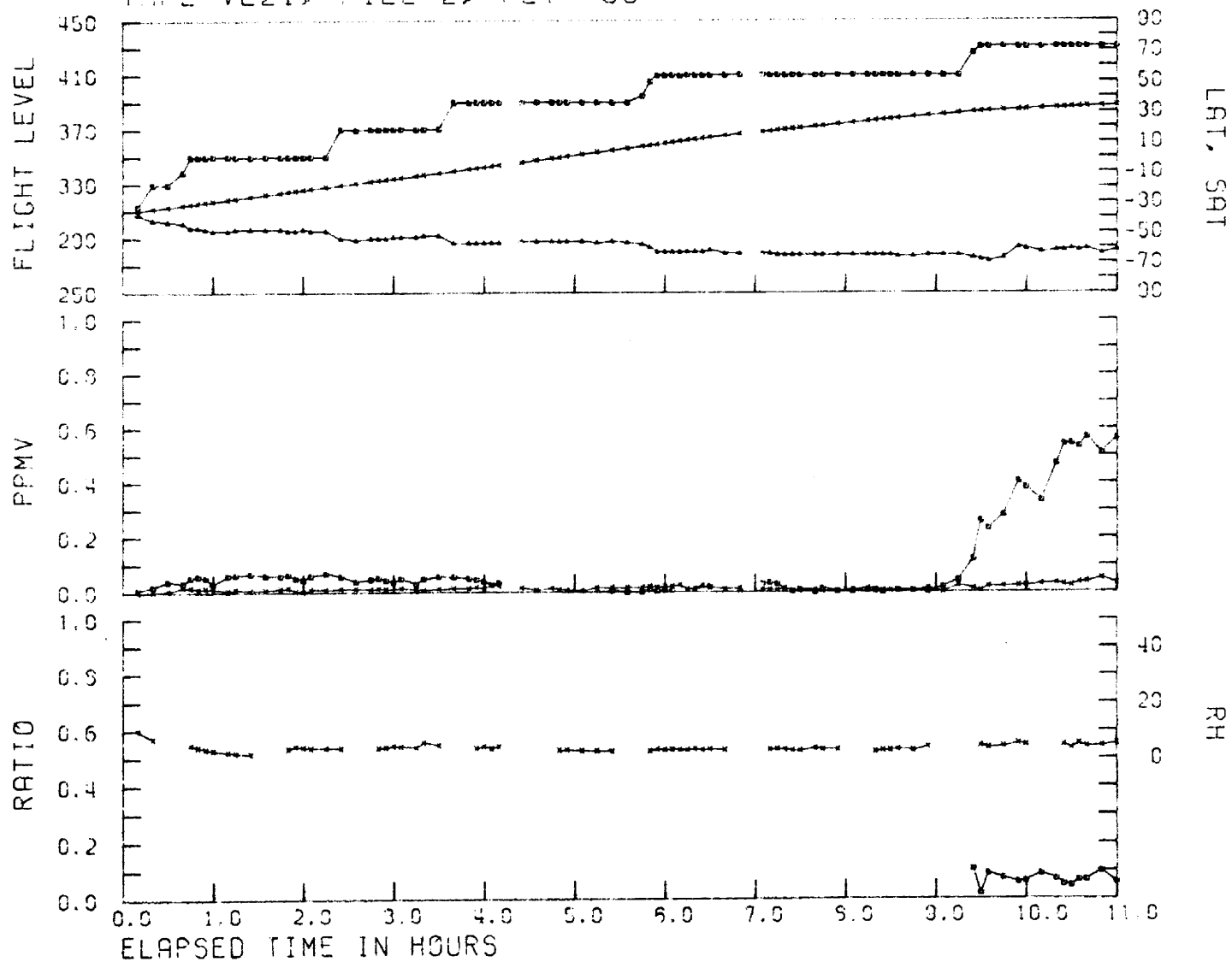
B-202

SYD TO AKL DEPARTURE 17 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 84

B-203

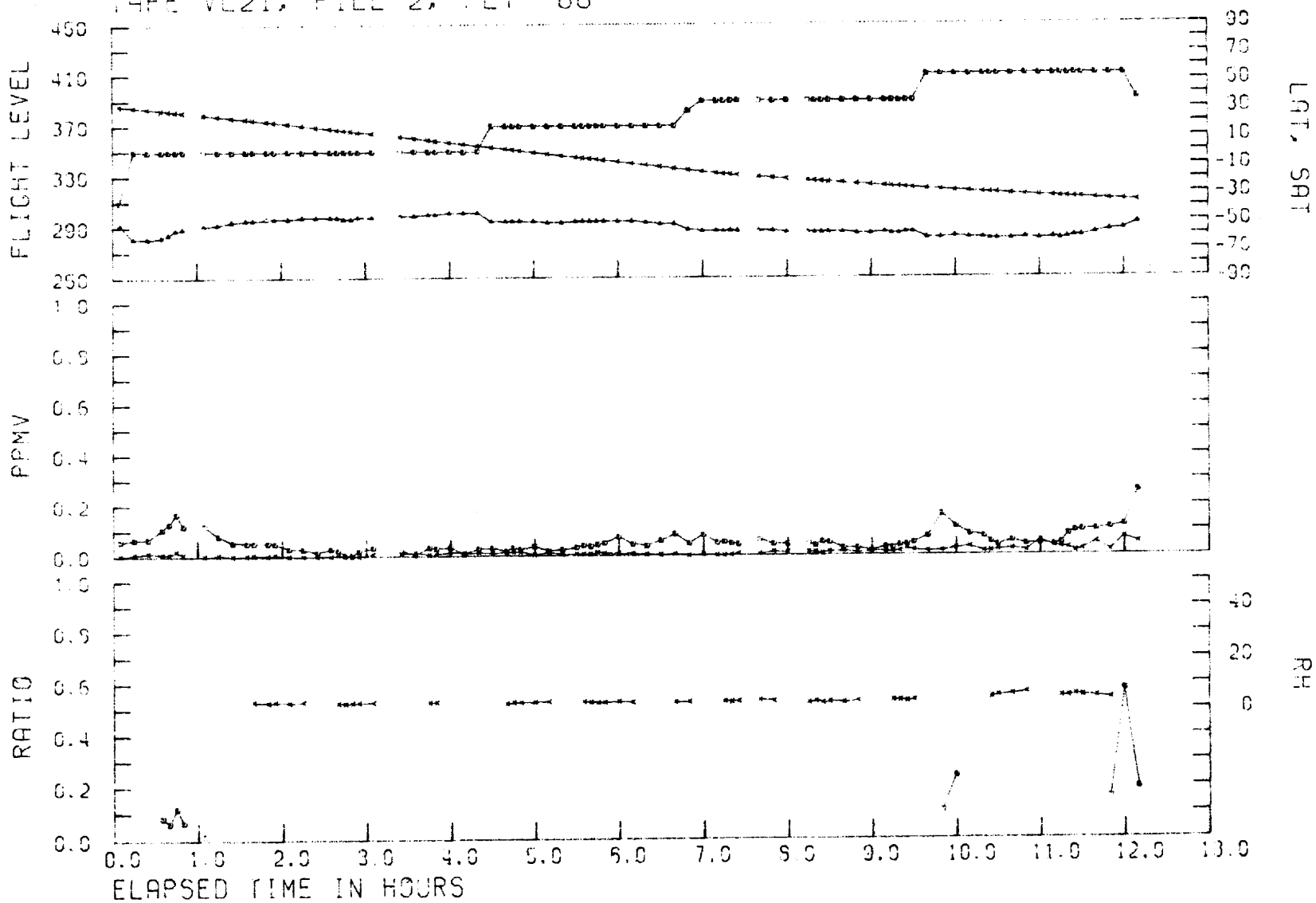


AKL TO LAX DEPARTURE 17 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 85



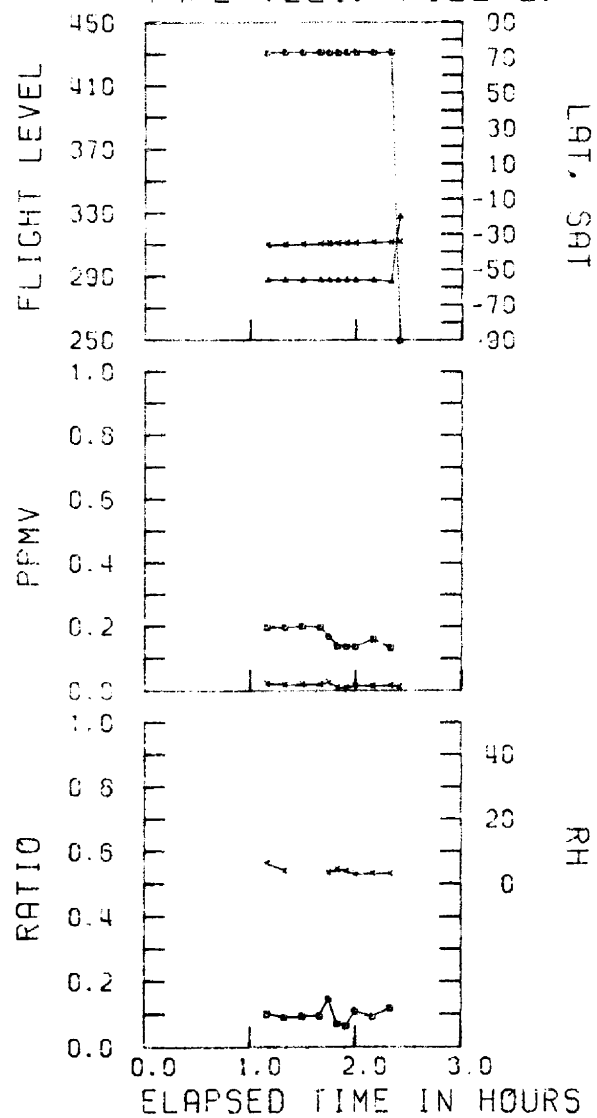
B-204

LAX TO AKL DEPARTURE 18 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 86

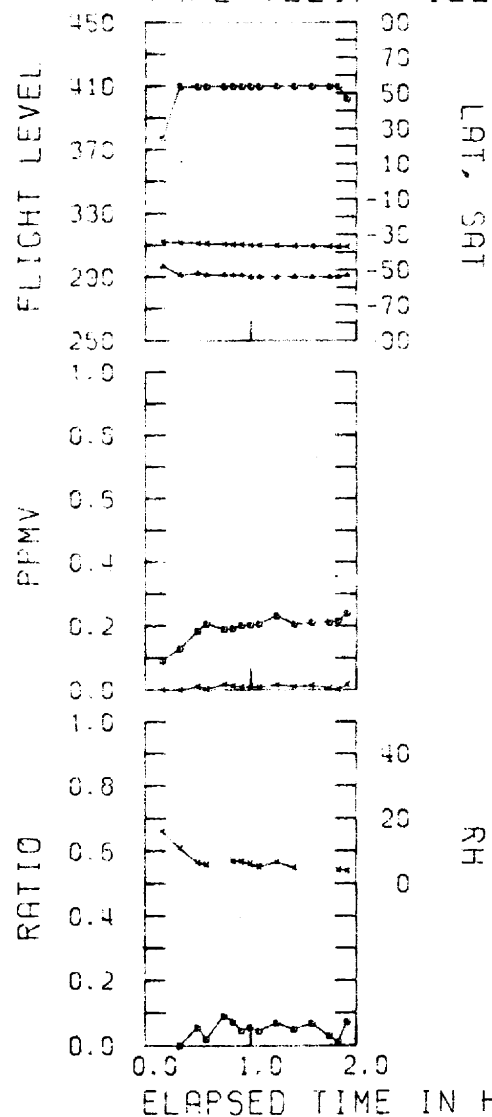


B-205

AKL TO SYD DEPARTURE 18 FEB 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 87

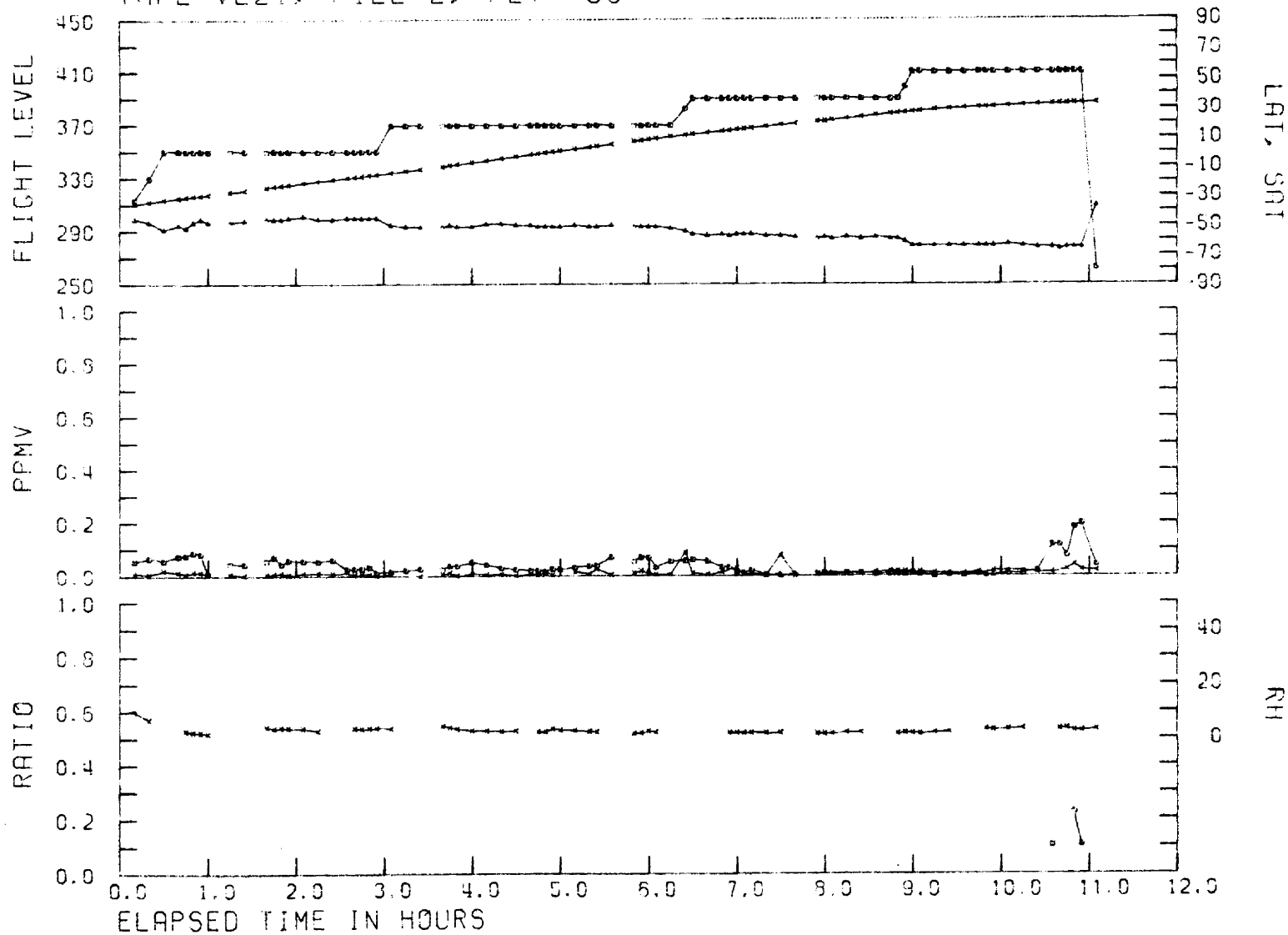


SYD TO AKL DEPARTURE 19 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 88



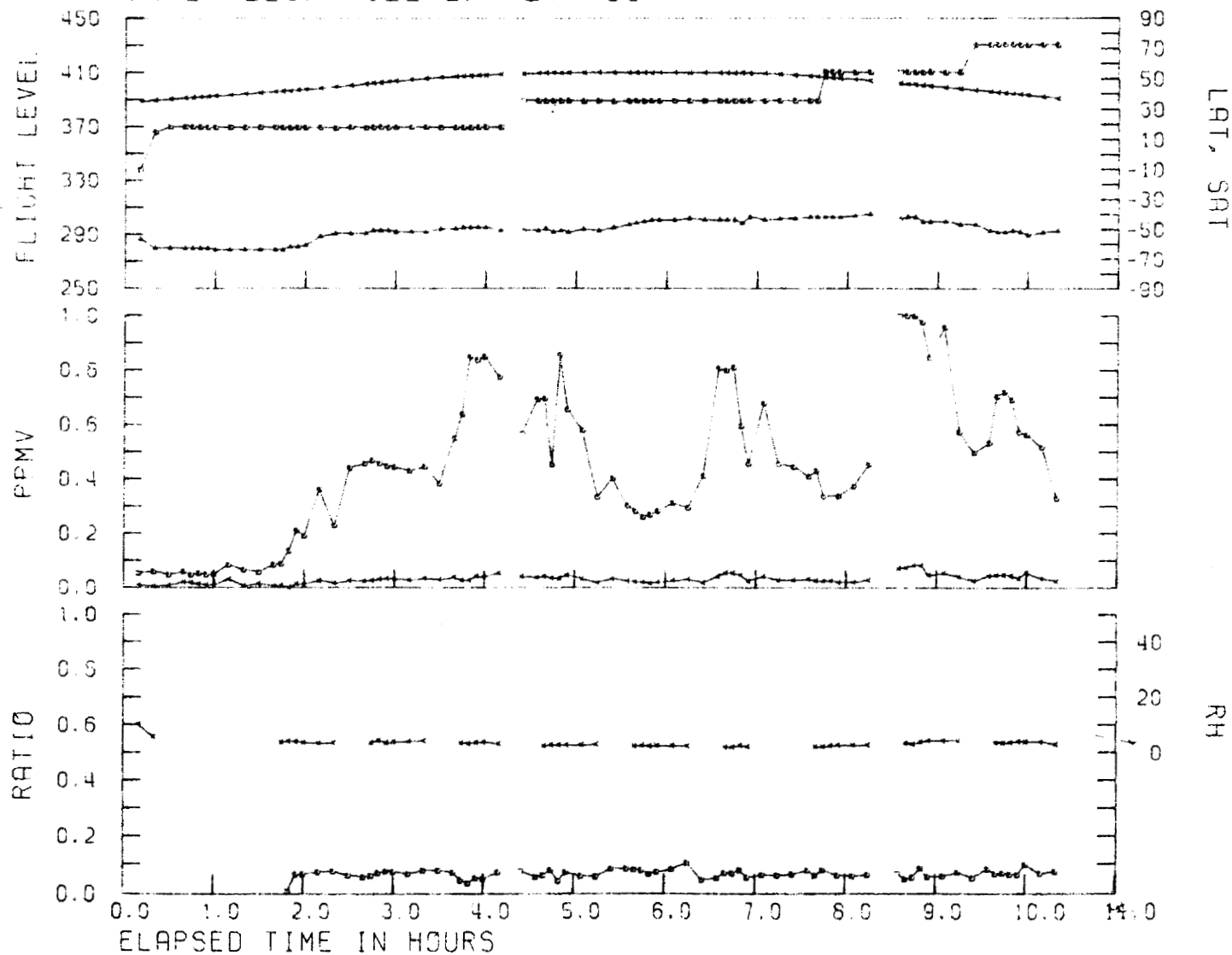
B-207

AKL TO LAX DEPARTURE 19 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 89



B-208

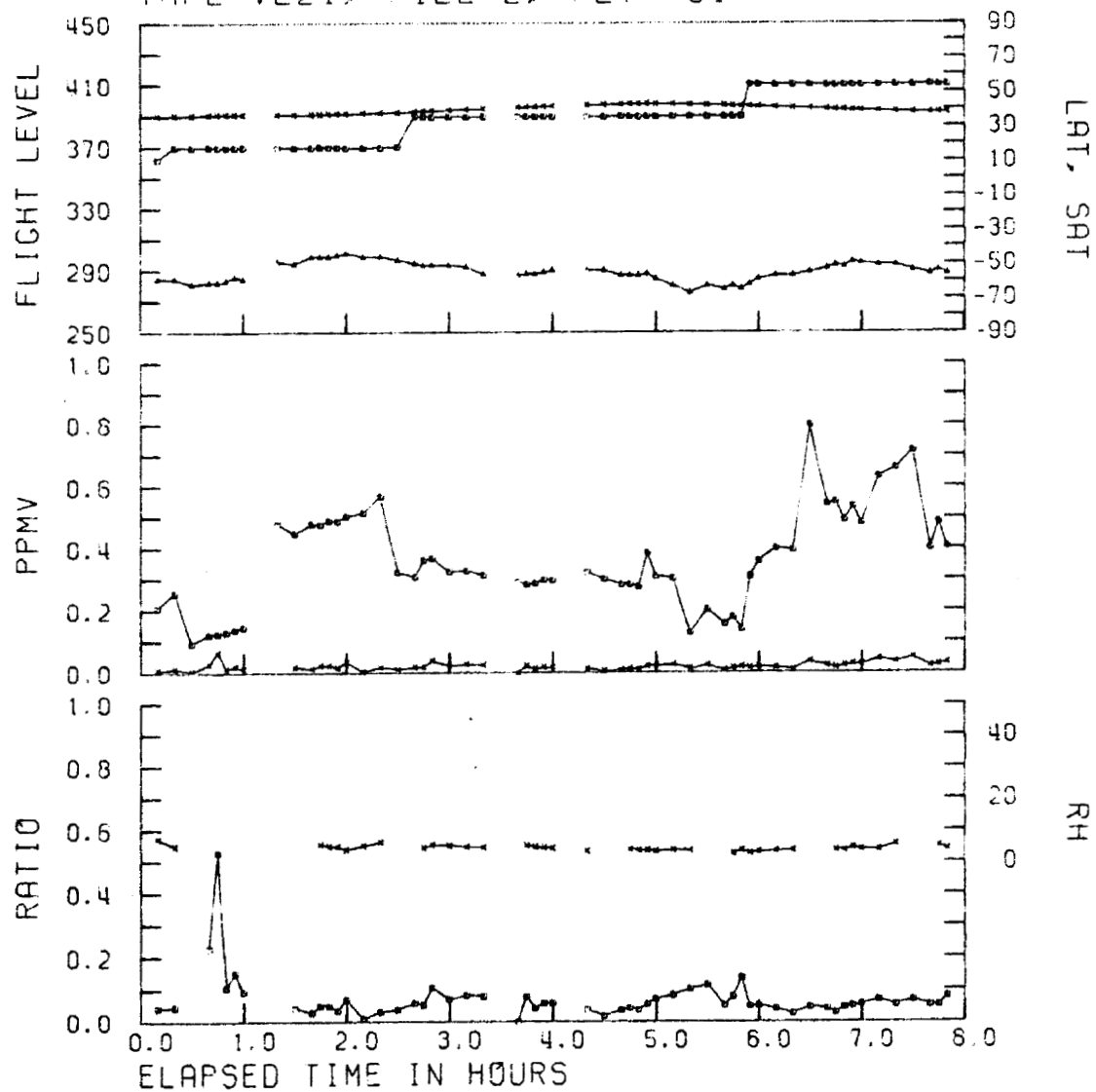
LAX TO NRT DEPARTURE 19 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 90



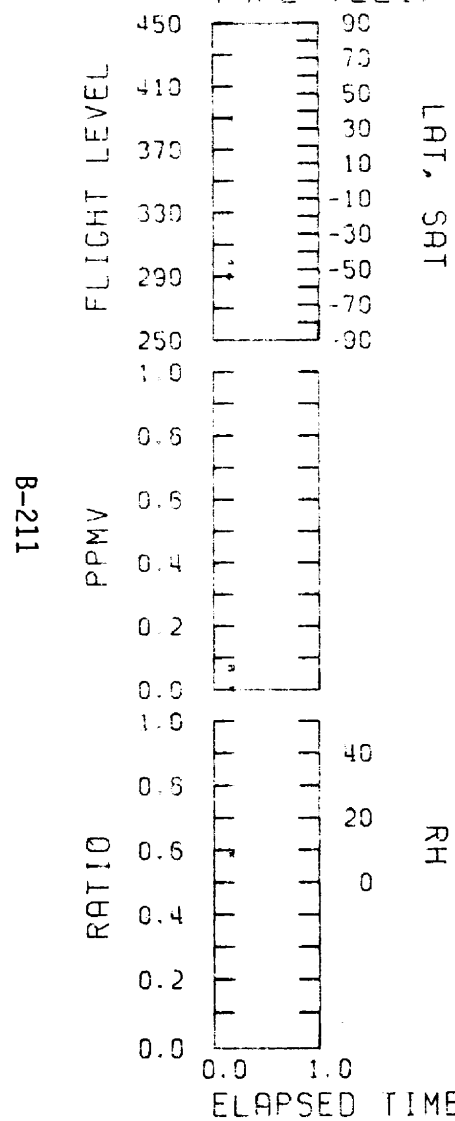
8-209

NRT TO SFO DEPARTURE 20 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 91

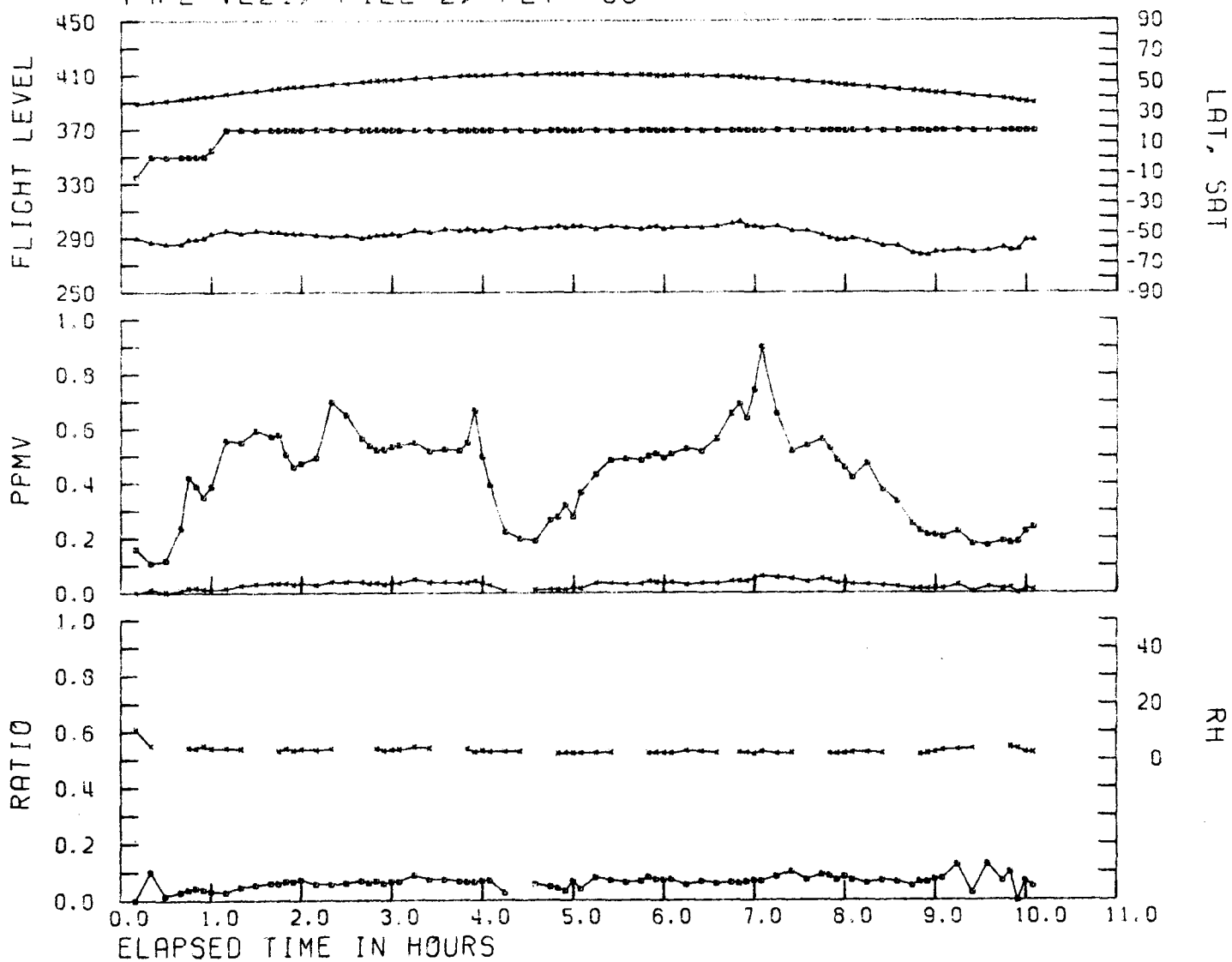
B-210



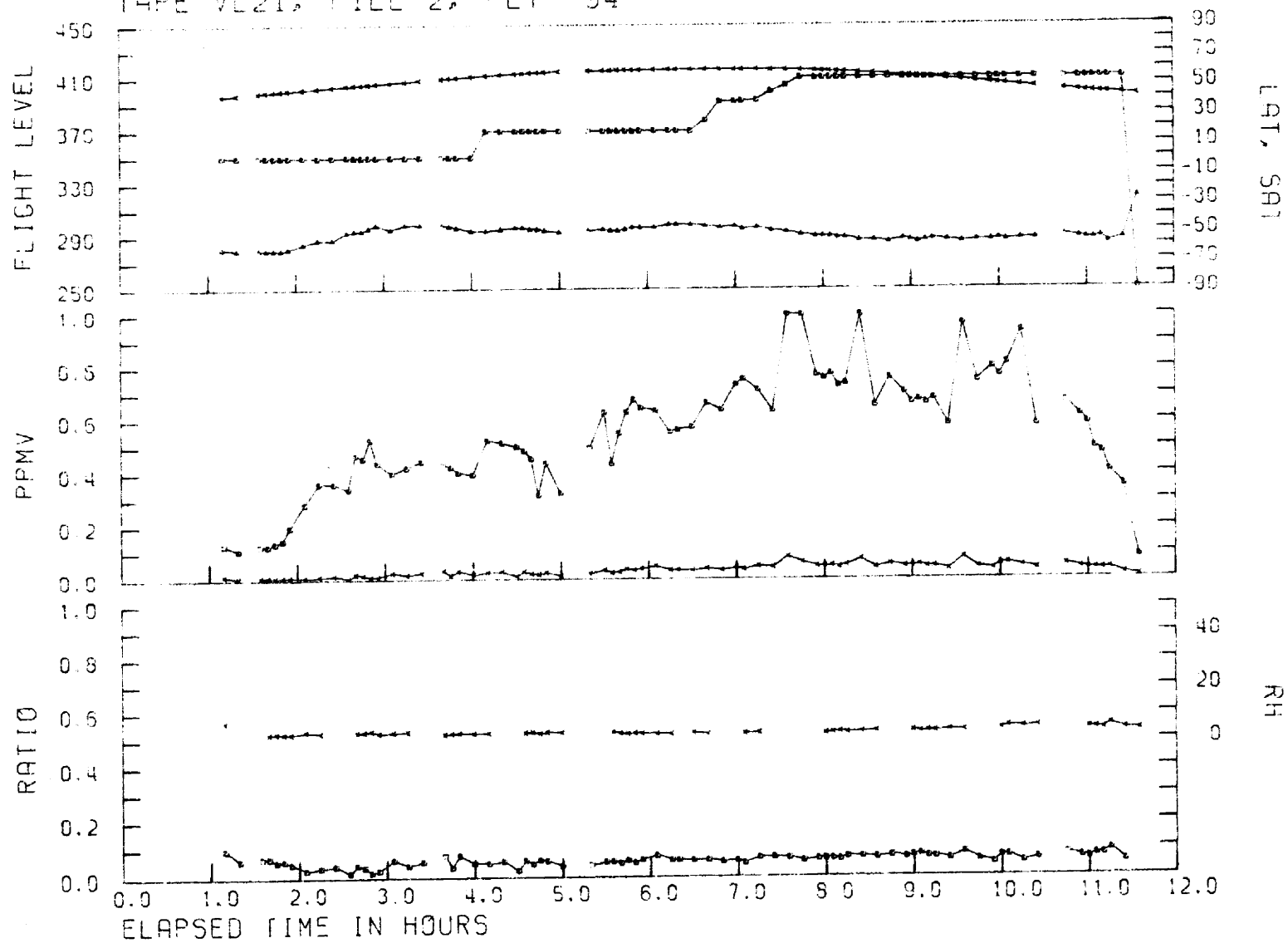
SFO TO LAX DEPARTURE 20 FEB 79 PANAM -N533PA
TAPE VL21. FILE 2, FLT 92



LAX TO NRT DEPARTURE 20 FEB 79 PANAM -N533PA
TAPE VL21, FILE 2, FLT 93

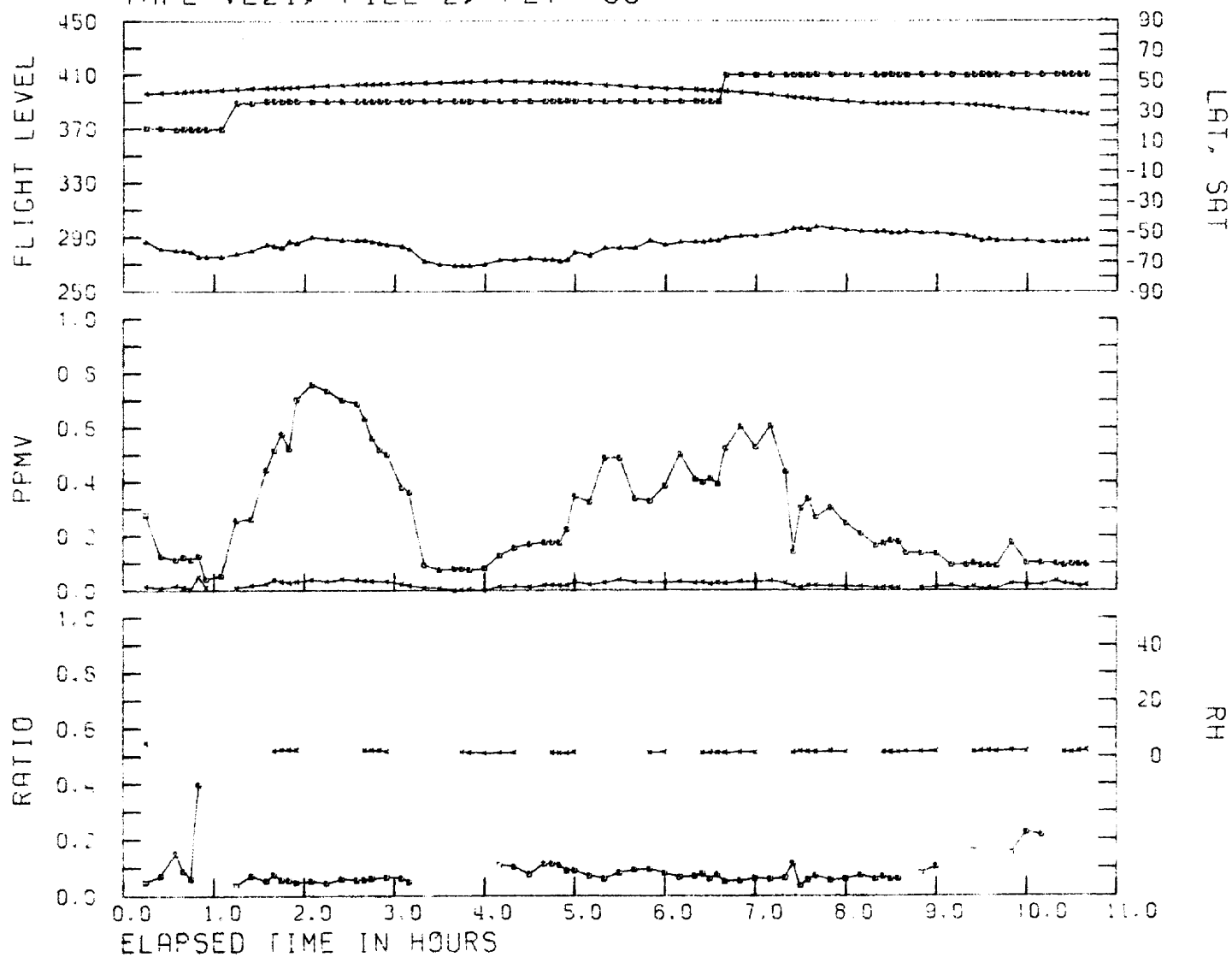


NRT TO JFK DEPARTURE 21 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 94



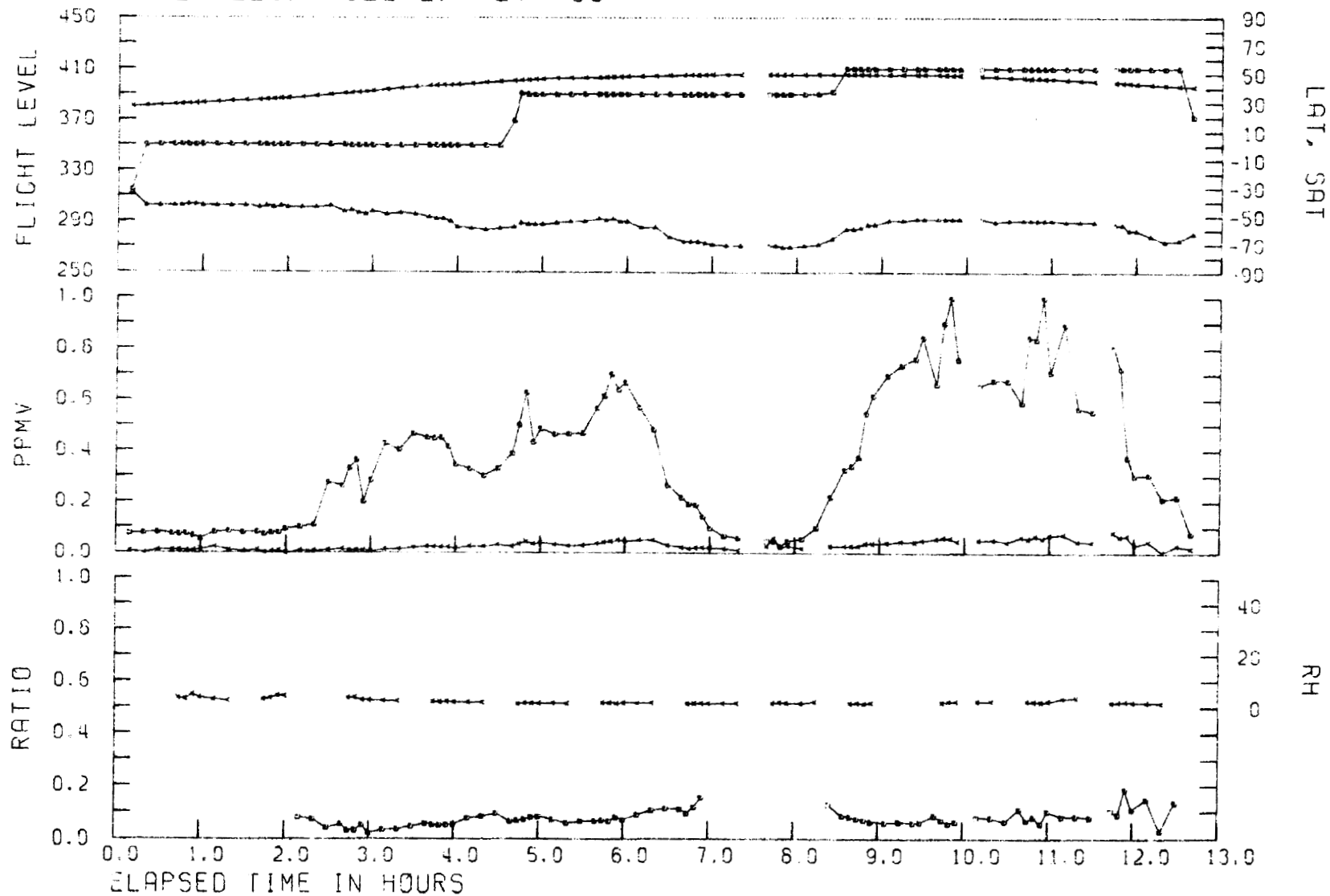
B-213

JFK TO DHA DEPARTURE 22 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 95



B-214

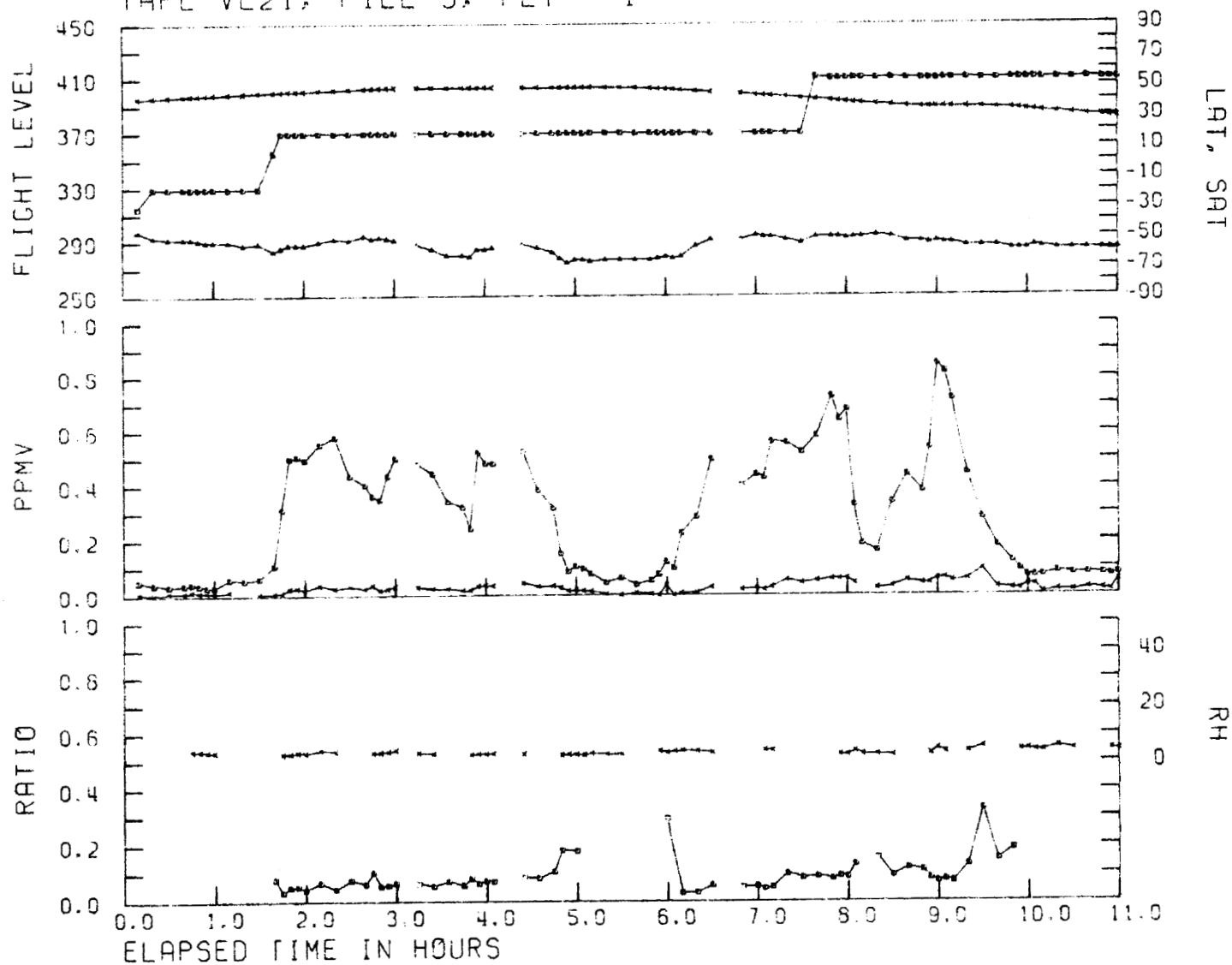
DHA TO JFK DEPARTURE 22 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 2, FLT 96



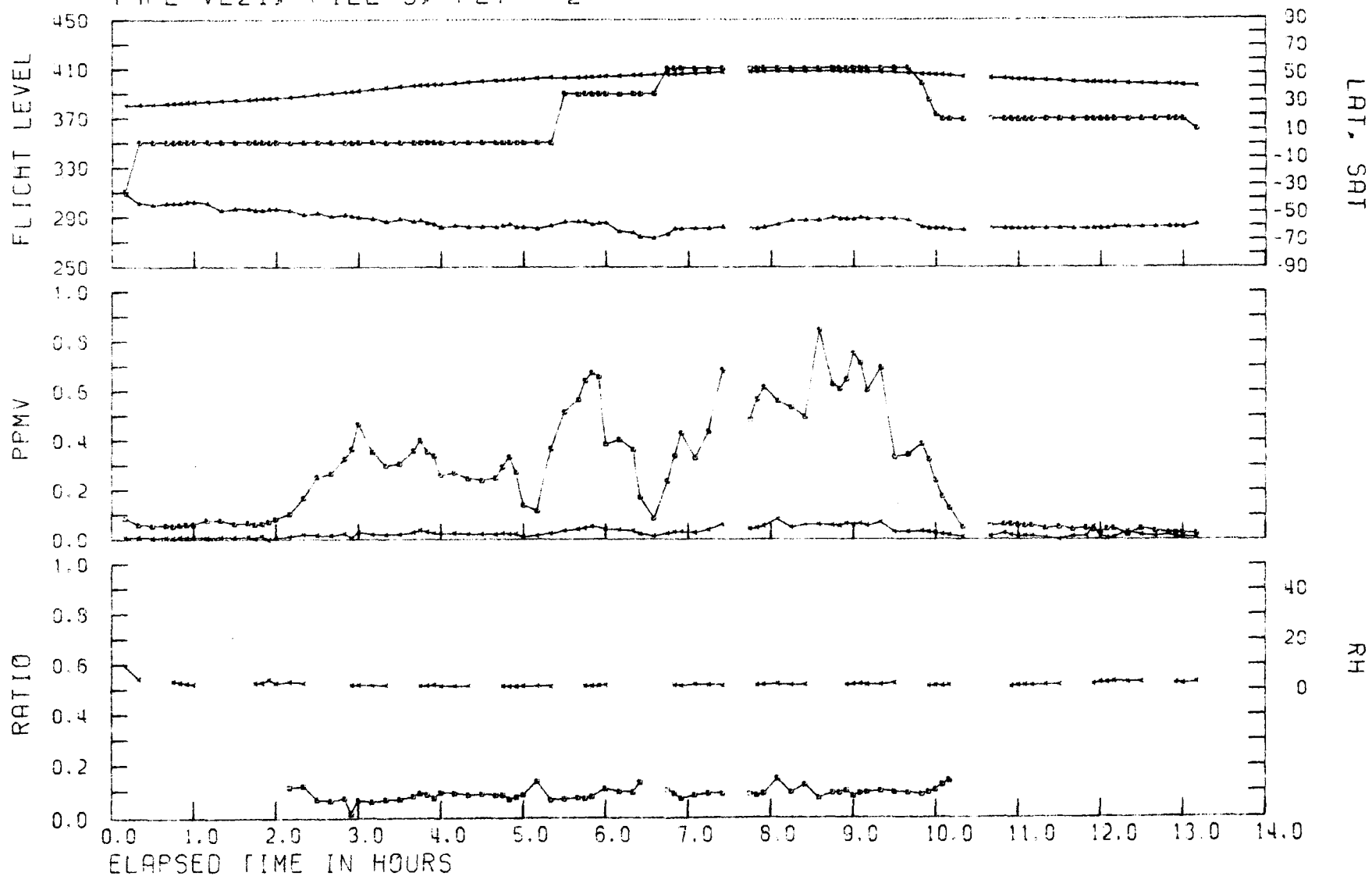
B-215

JFK TO DHA DEPARTURE 24 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 1

B-216



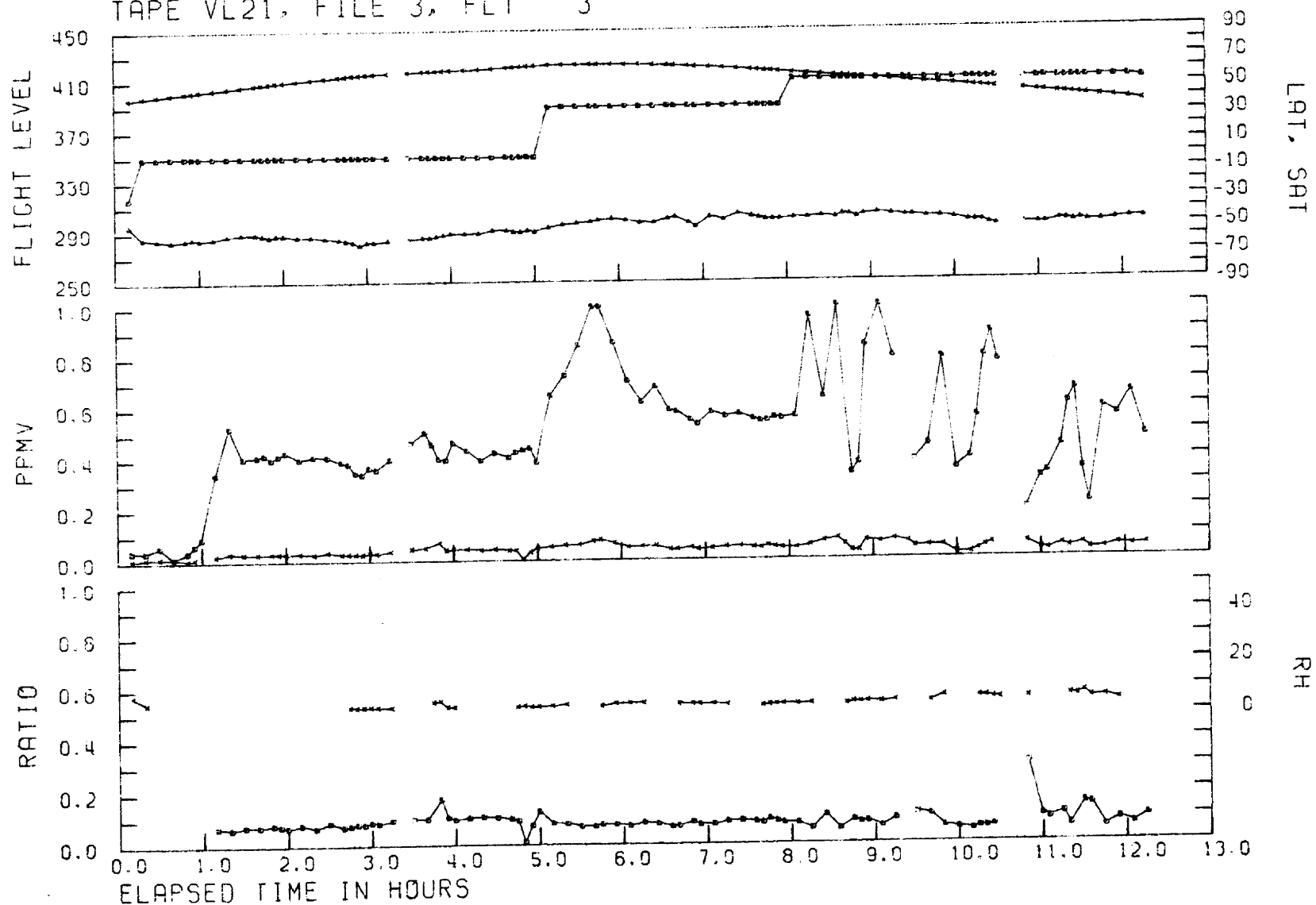
DHA TO JFK DEPARTURE 24 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 2



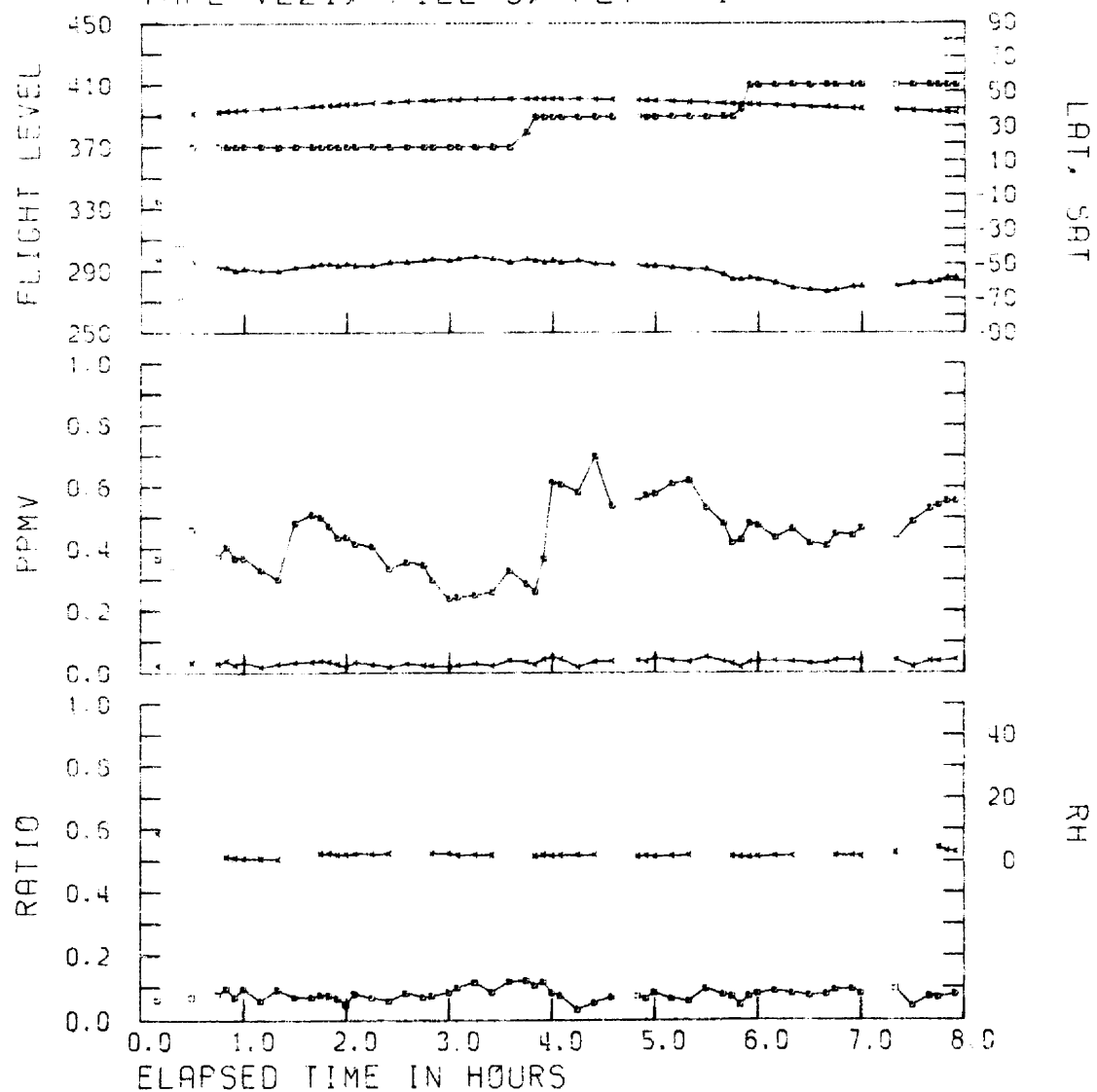
B-217

JFK TO NRT DEPARTURE 25 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 3

8-218

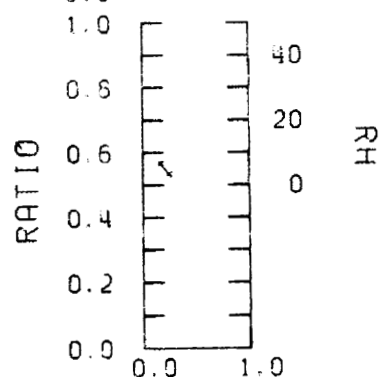
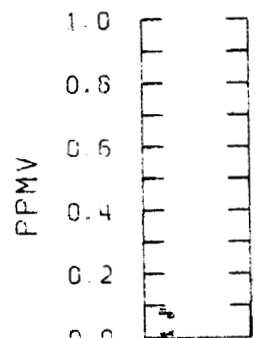
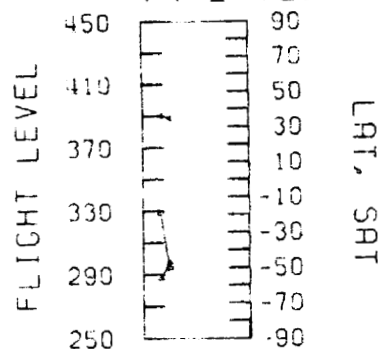


NRT TO SFO DEPARTURE 26 FEB 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 4



B-219

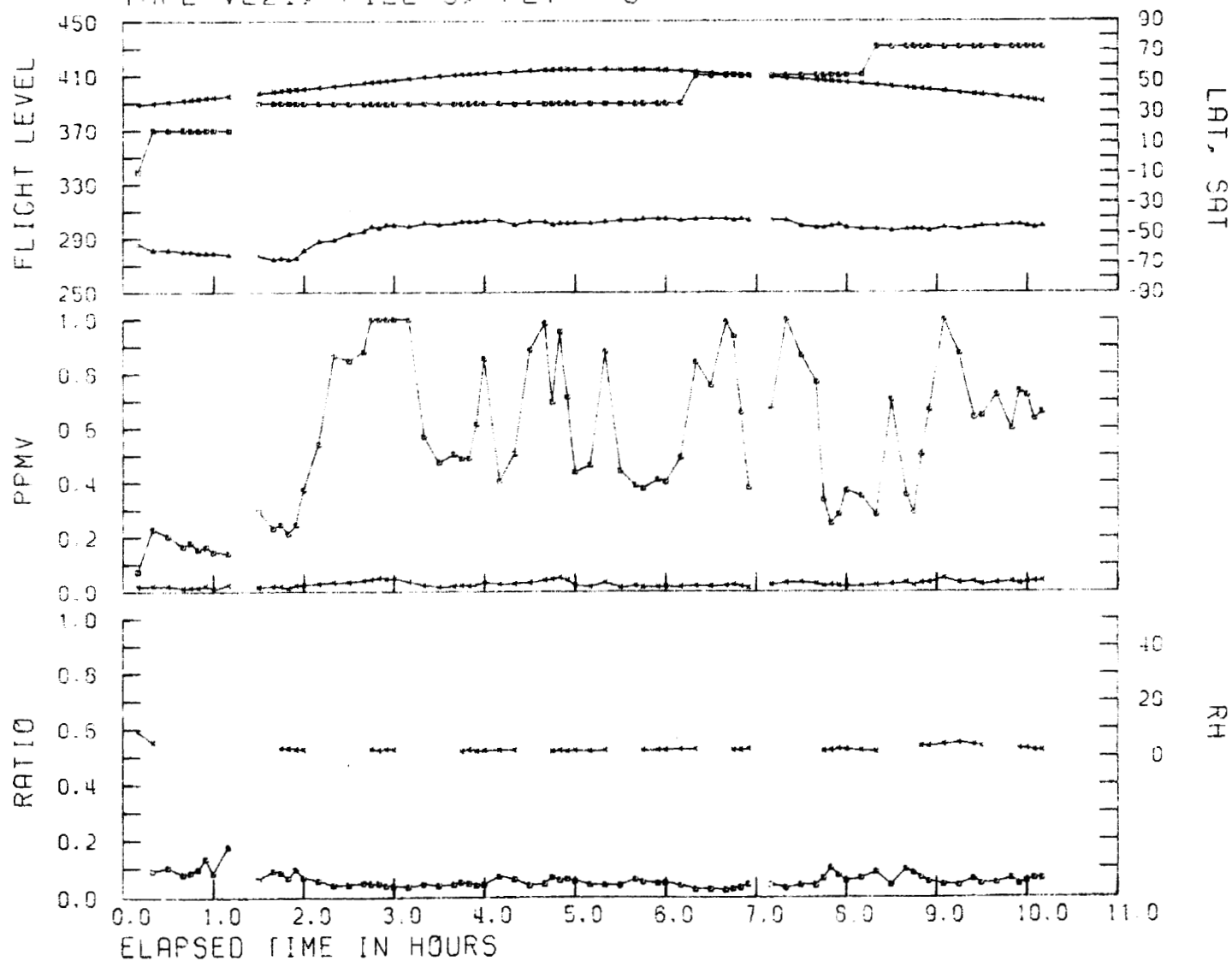
SFO TO LAX DEPARTURE 26 FEB 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 5



ELAPSED TIME IN HOURS

B-220

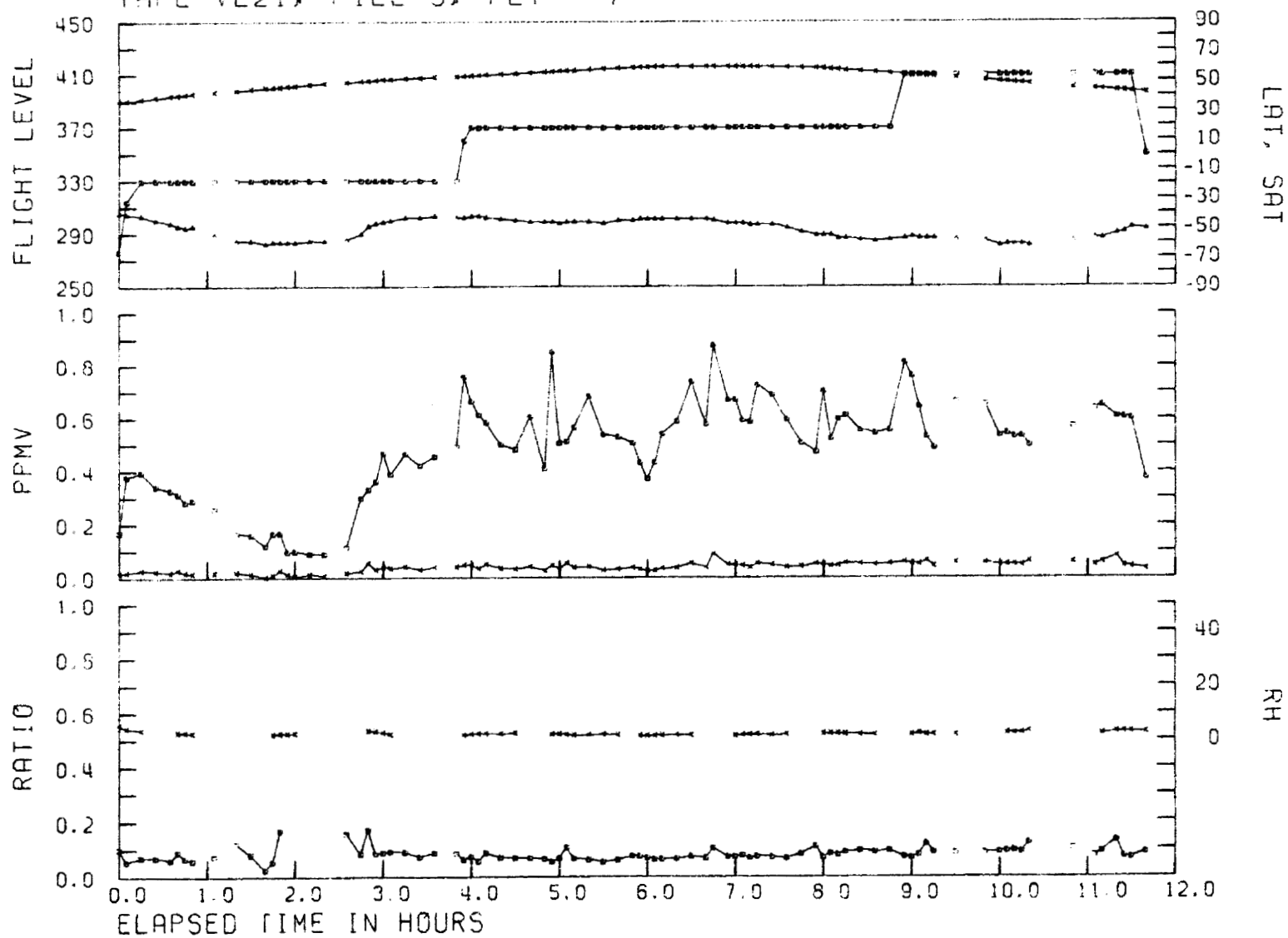
LAX TO NRT DEPARTURE 26 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 6



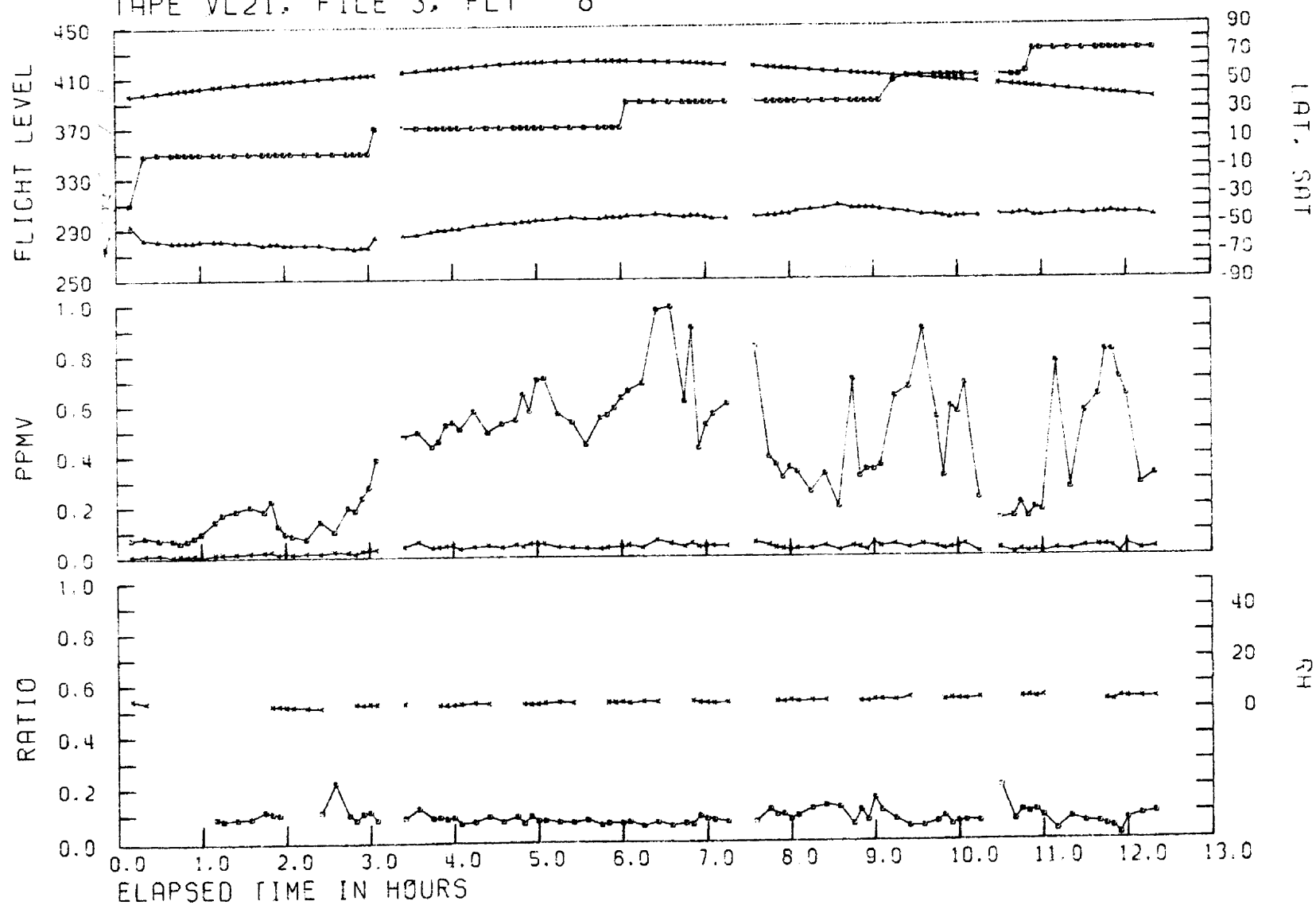
B-221

NRT TO JFK DEPARTURE 27 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 7

B-222

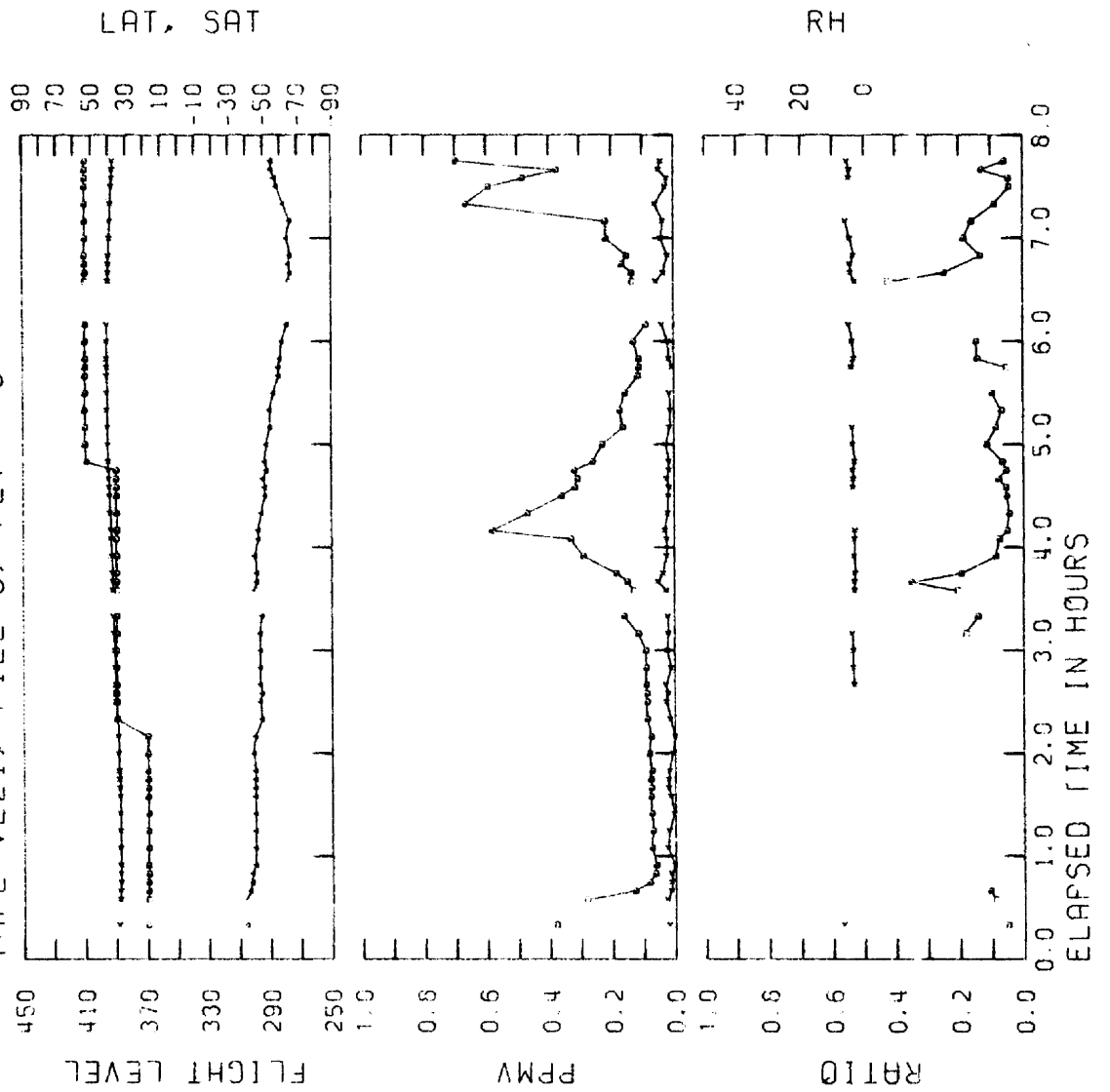


JFK TO NRT DEPARTURE 28 FEB 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 8

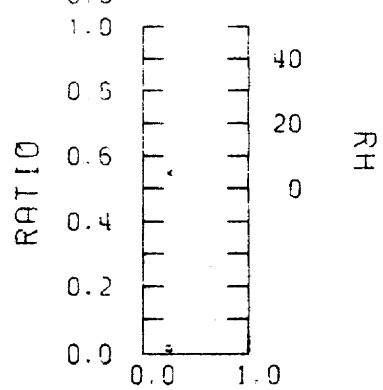
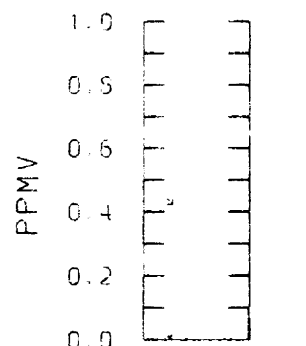
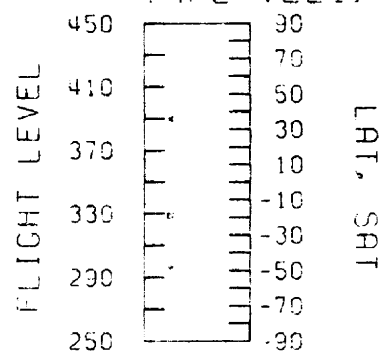


B-223

NRT TO SFO DEPARTURE 1 MAR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 9



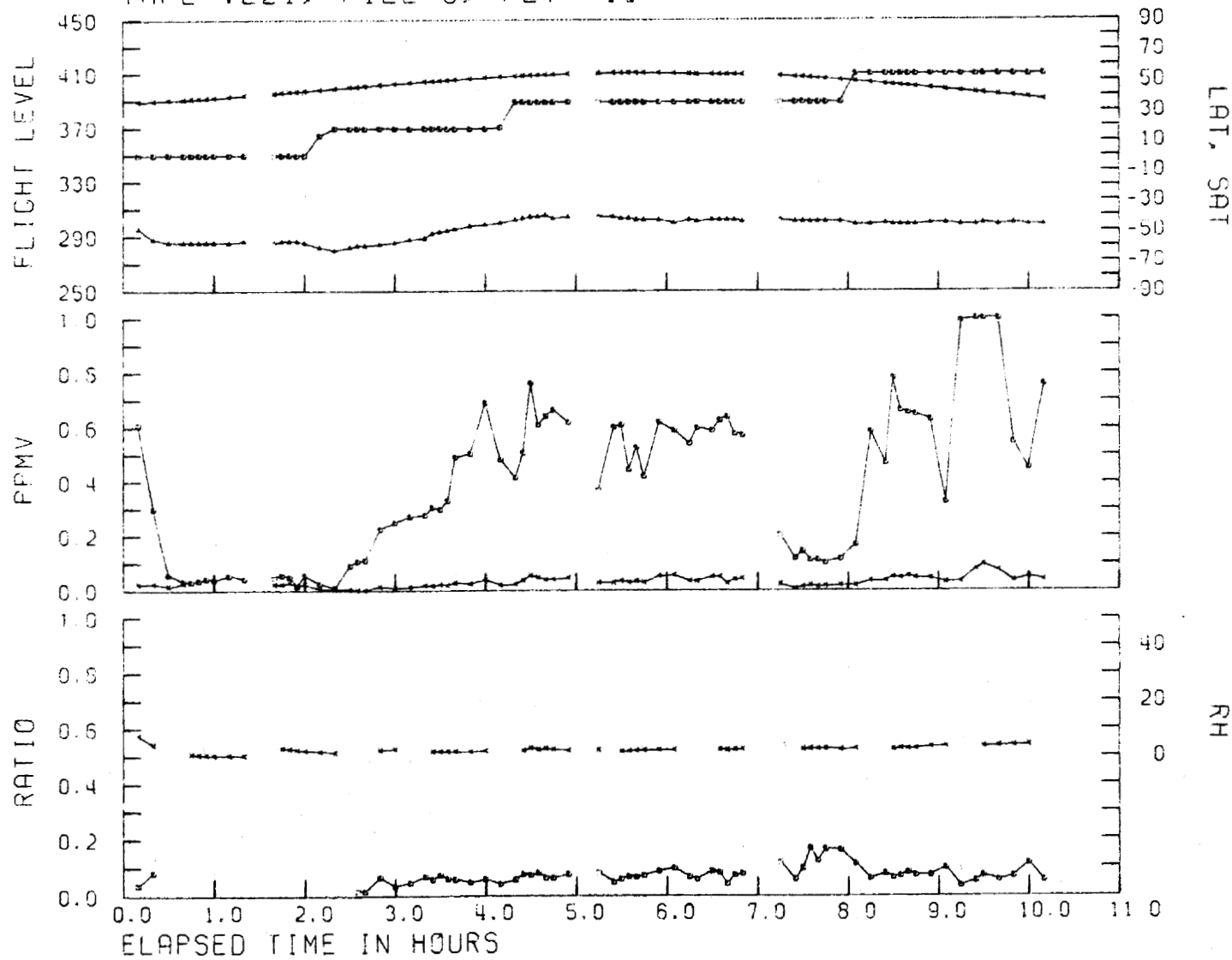
SFO TO LAX DEPARTURE 1 MAR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 10



ELAPSED TIME IN HOURS

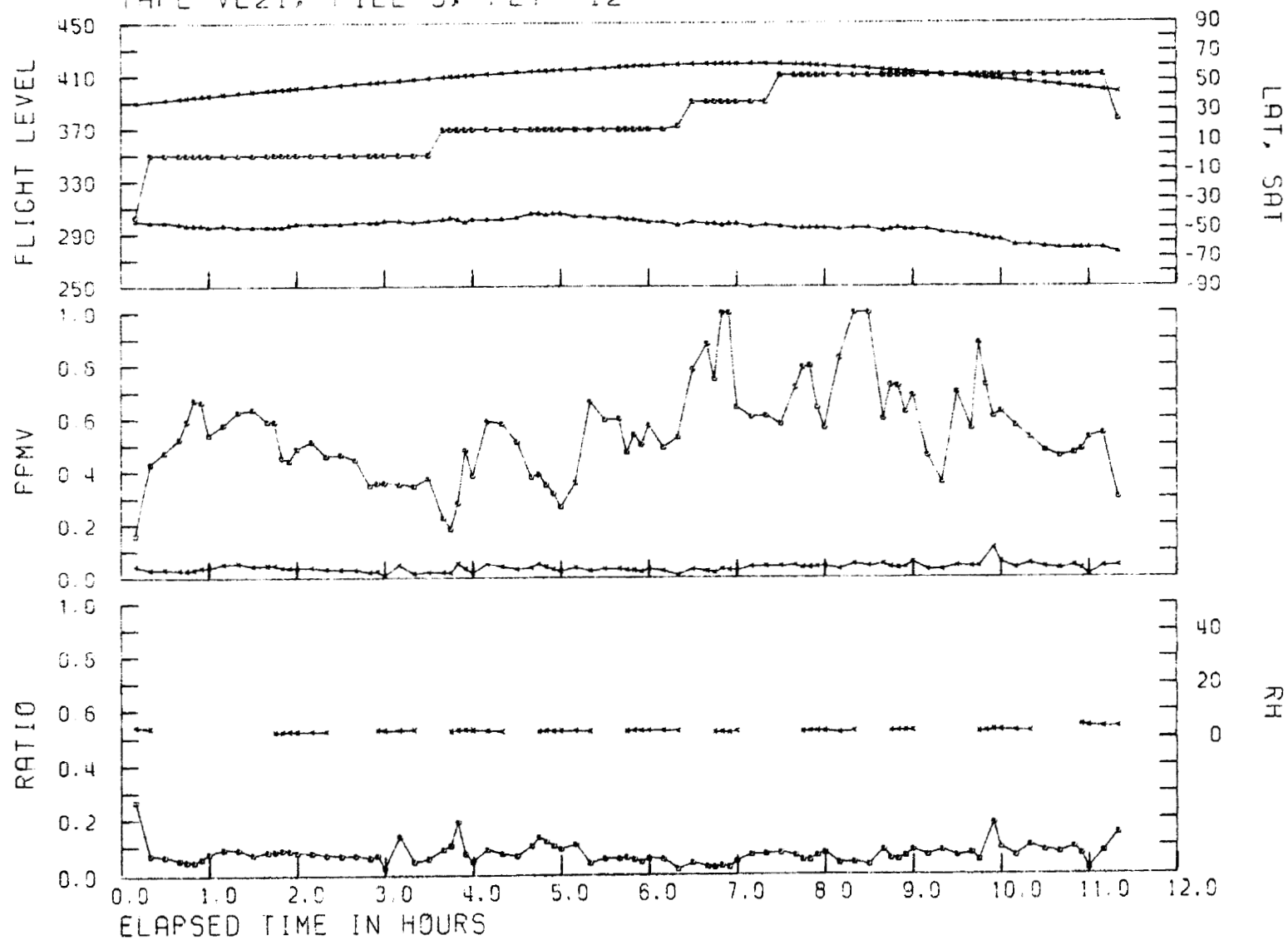
B-225

LAX TO NRT DEPARTURE 1 MAR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 11



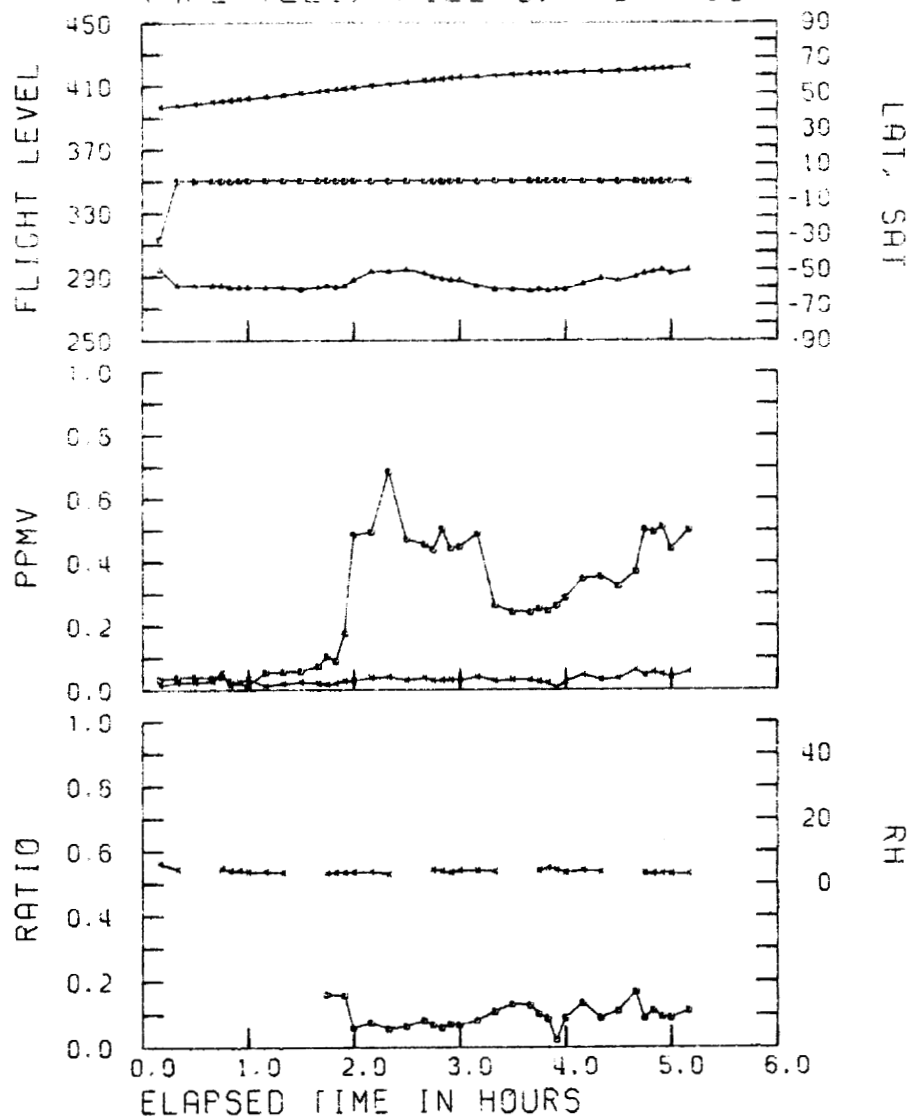
B-226

NRT TO JFK DEPARTURE 2 MAR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 12

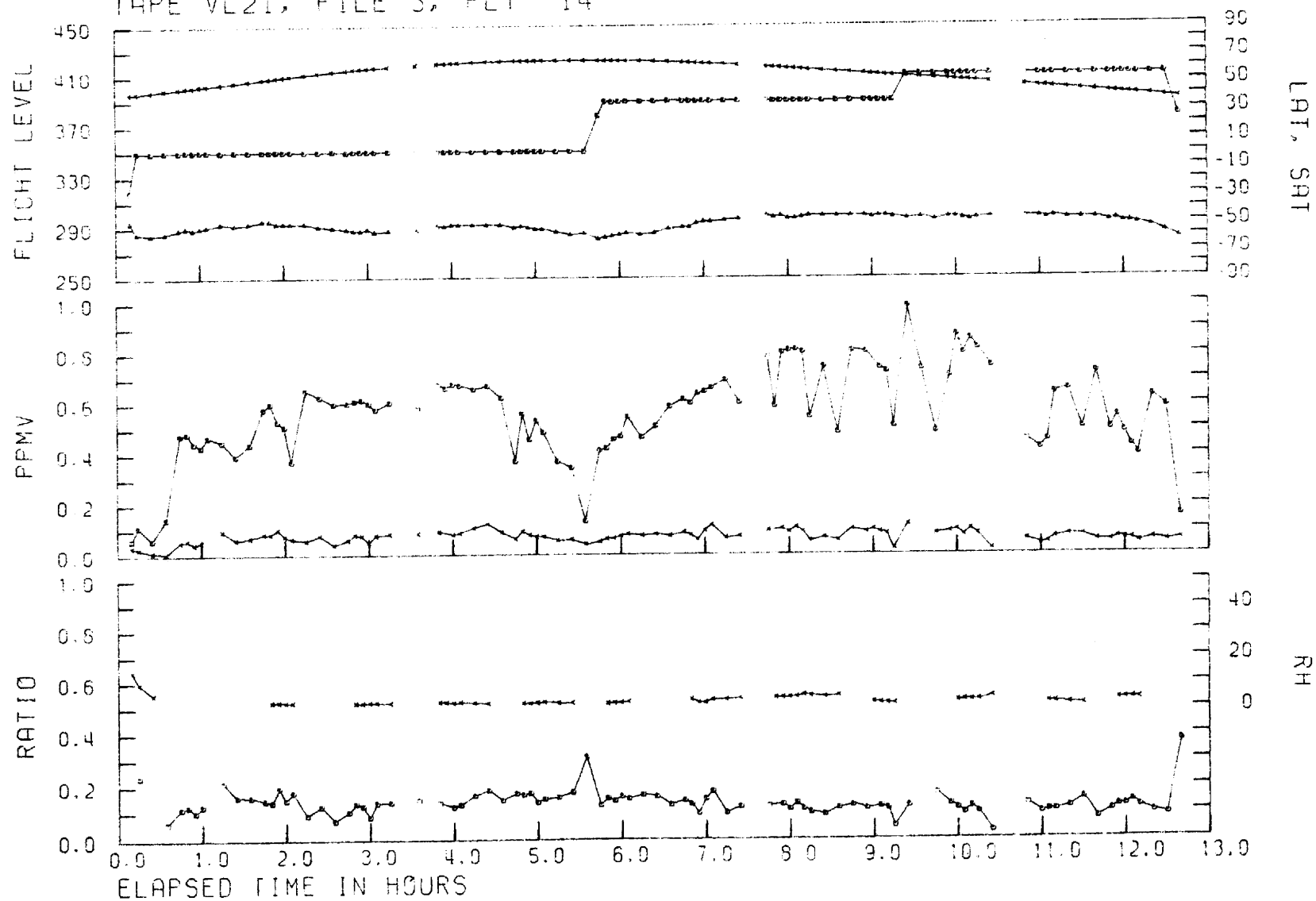


B-227

JFK TO NRT DEPARTURE 3 MAR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 13

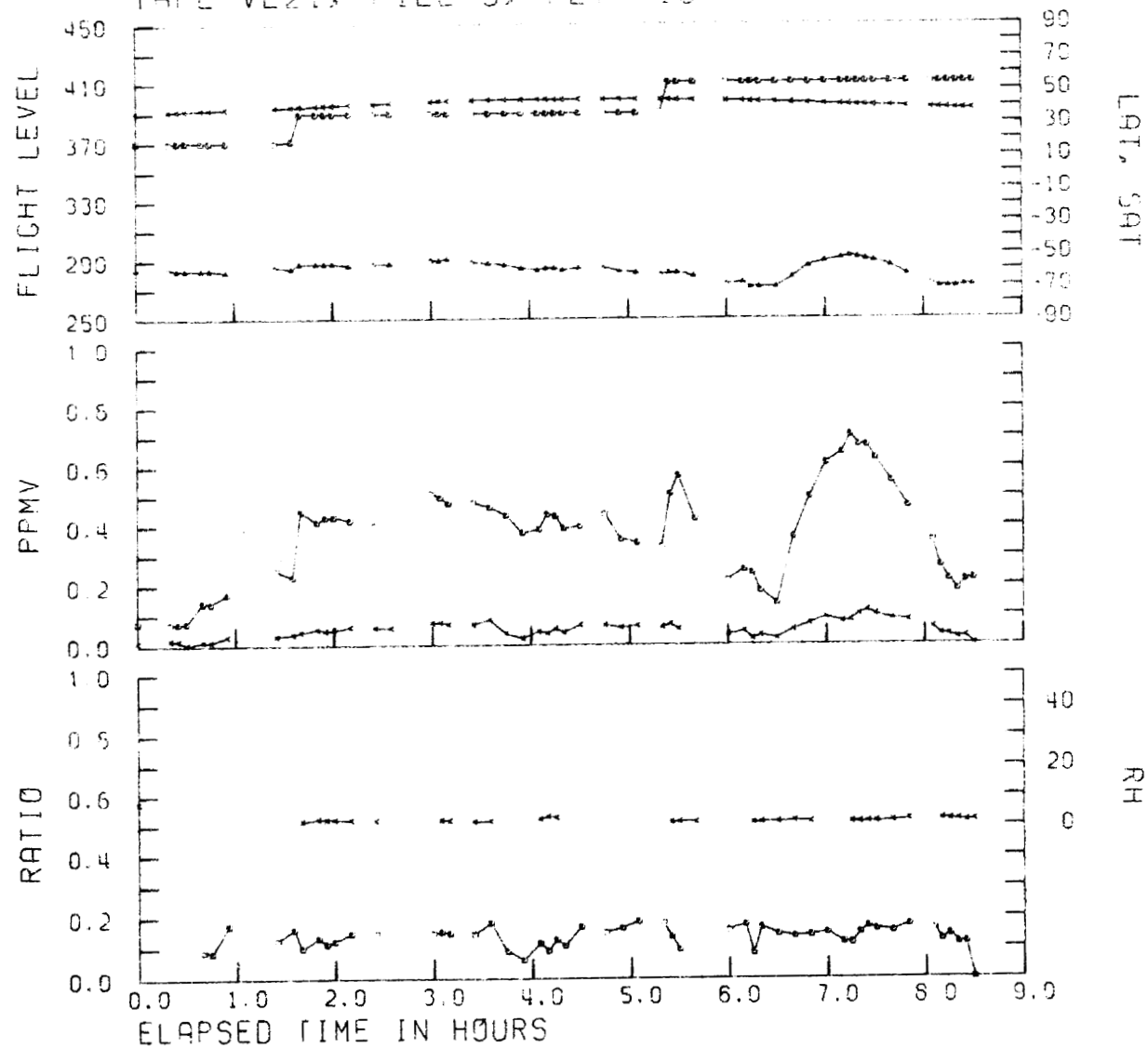


JFK TO NRT DEPARTURE 3 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 14



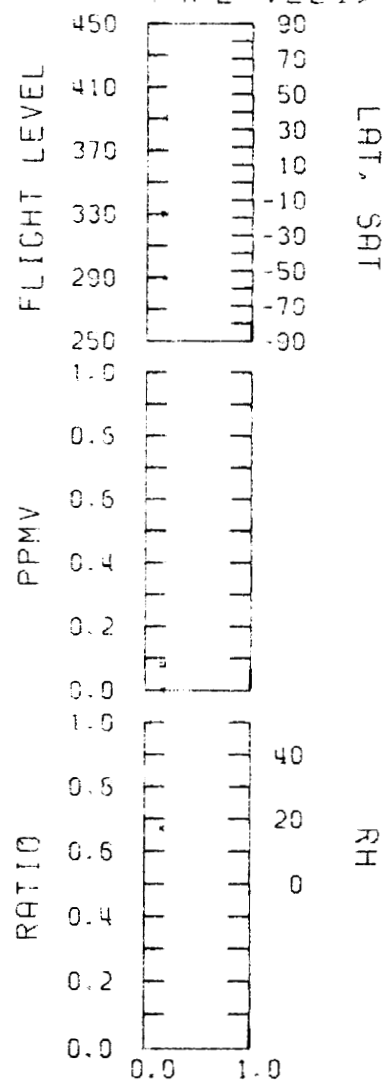
B-229

NRT TO SFO DEPARTURE 4 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 15



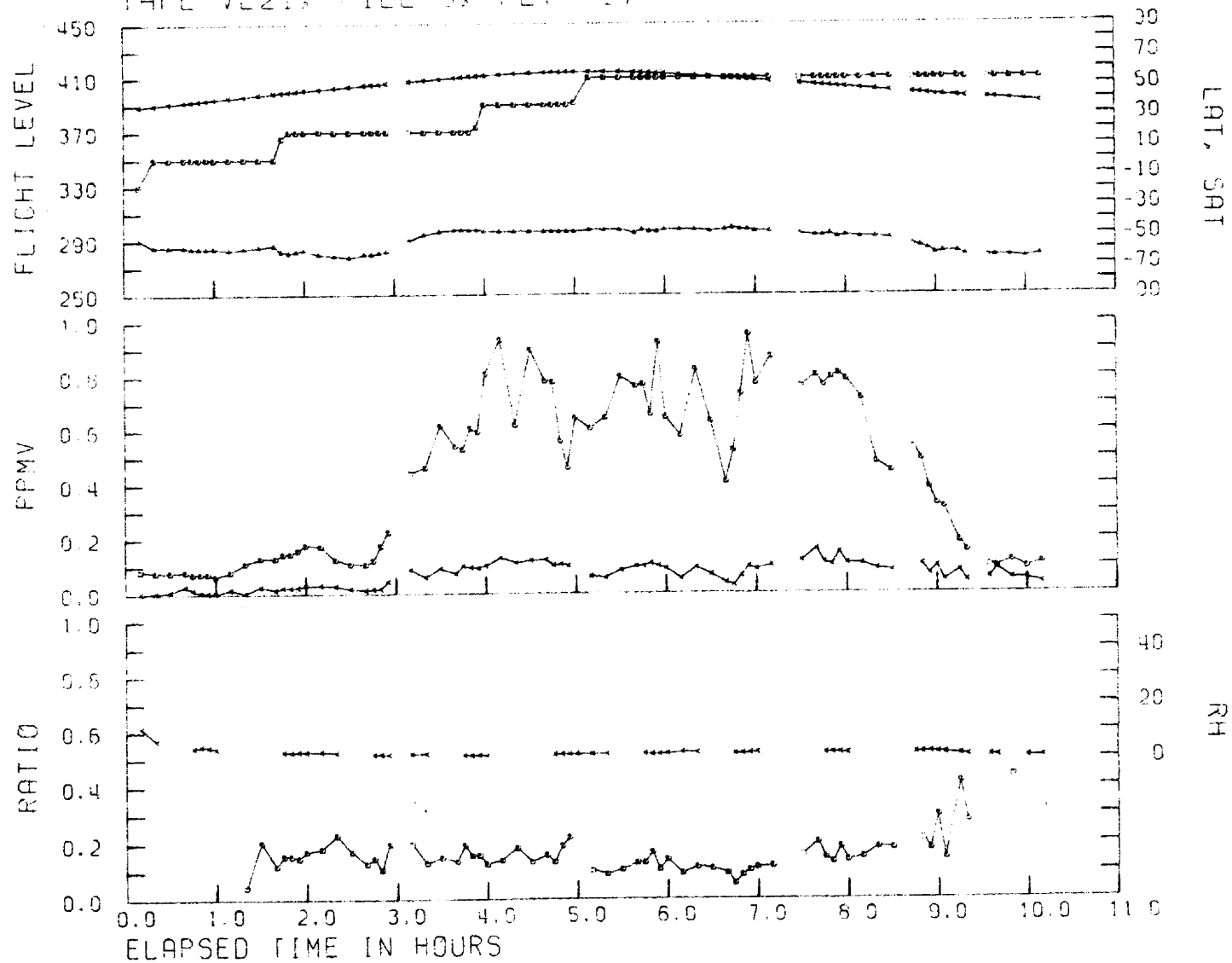
B-230

SFO TO LAX DEPARTURE 4 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 16



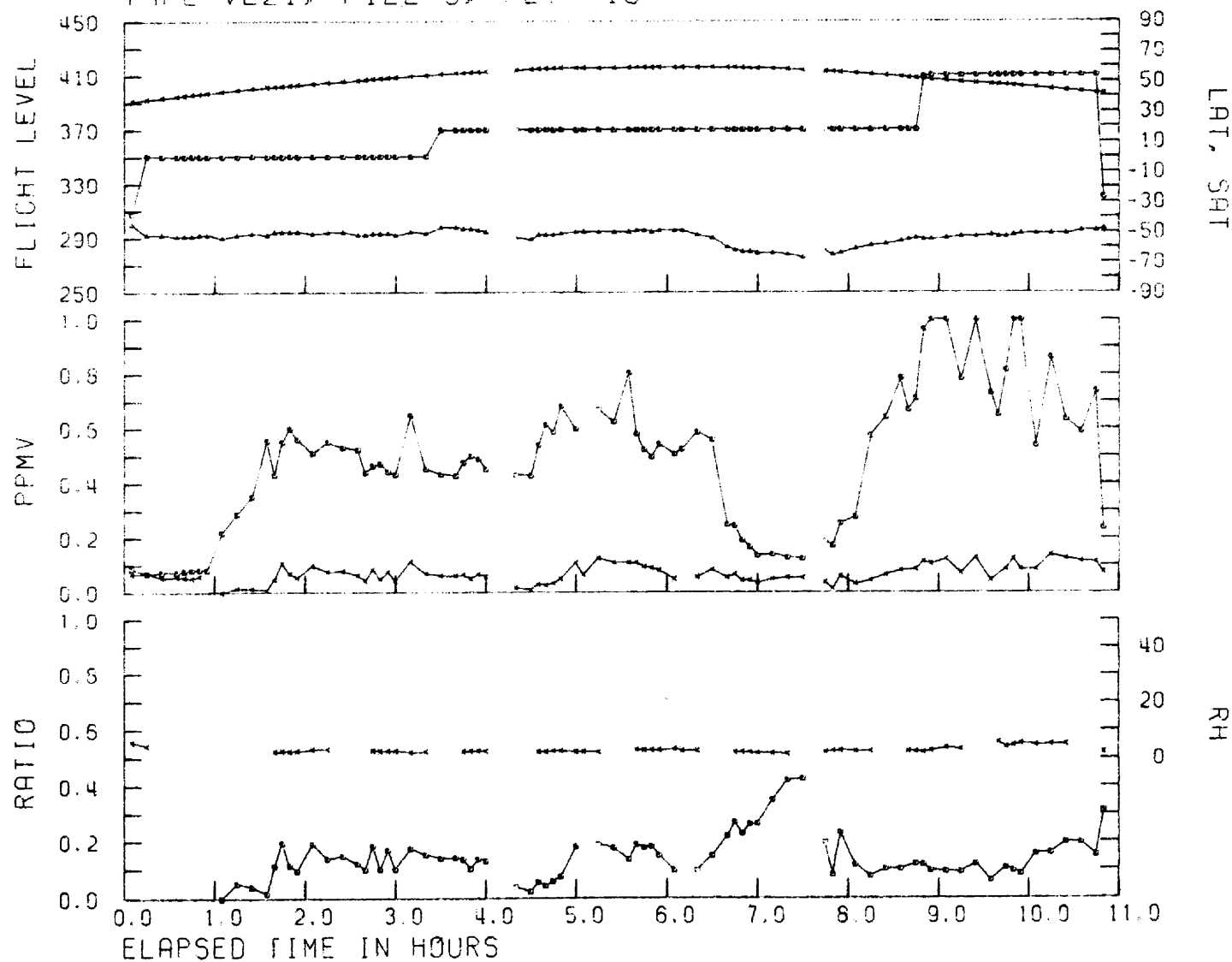
B-231

LAX TO NRT DEPARTURE 4 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 17



B-232

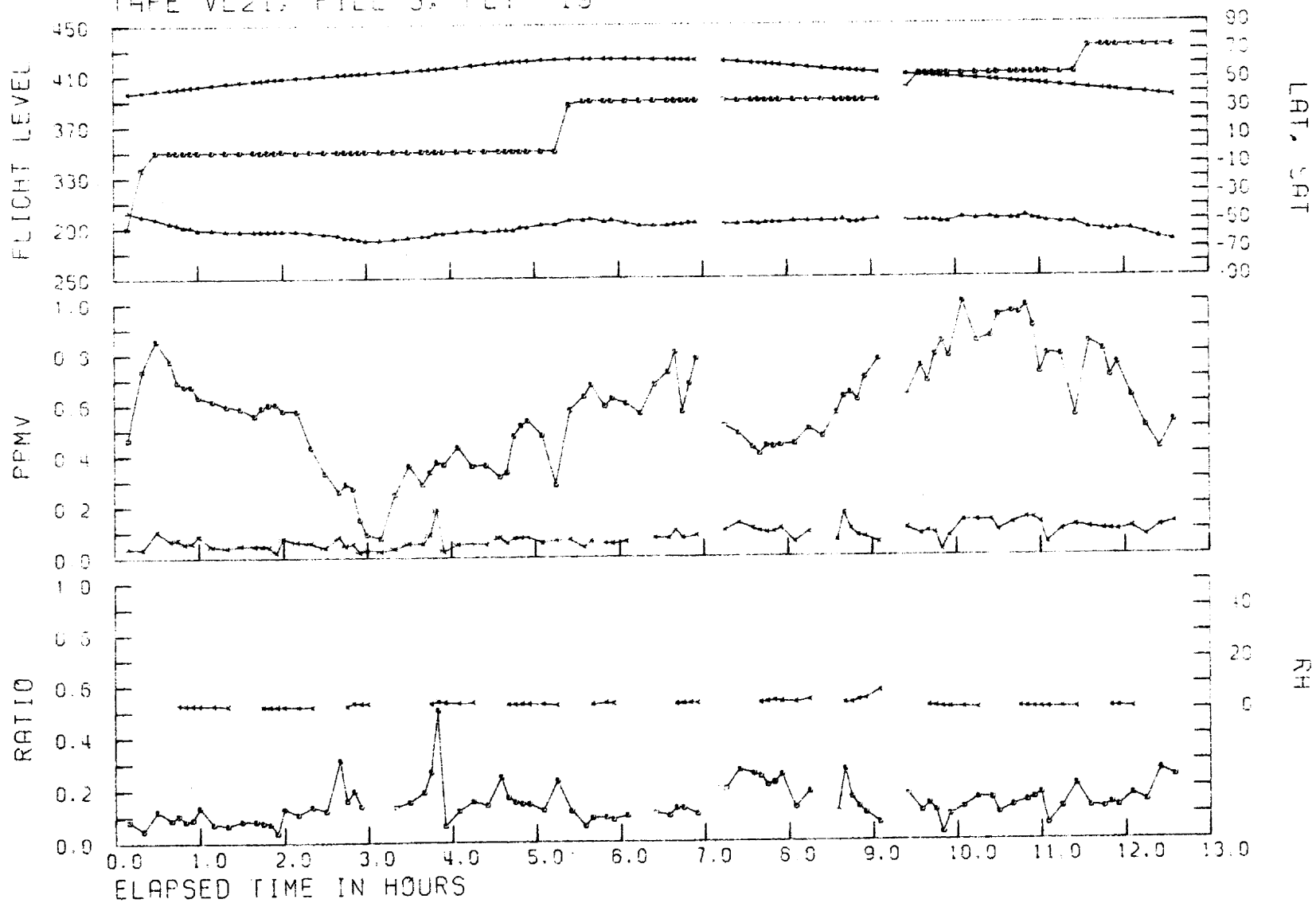
NRT TO JFK DEPARTURE 5 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 18



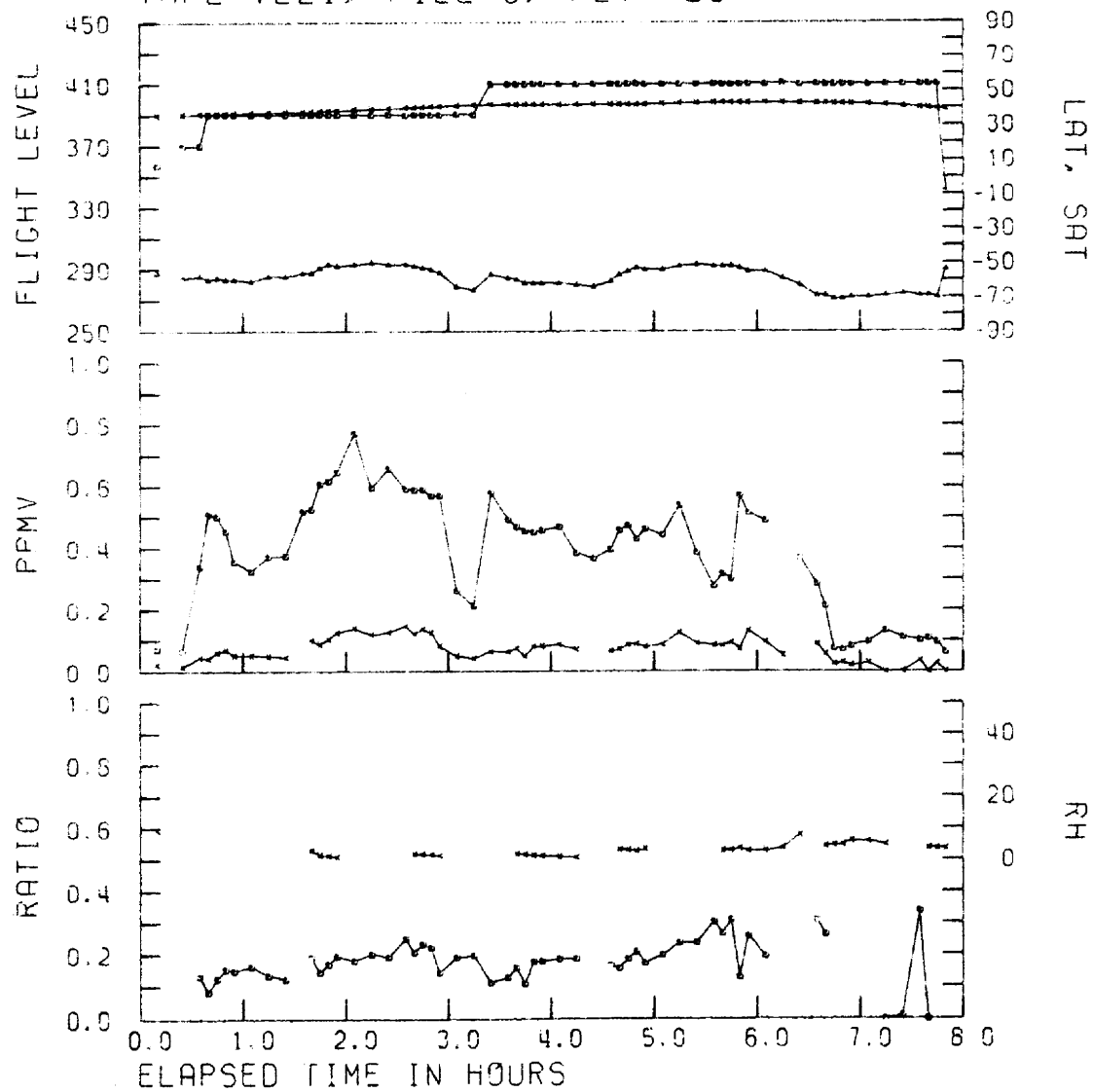
B-233

JFK TO NRT DEPARTURE 6 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 19

B-234



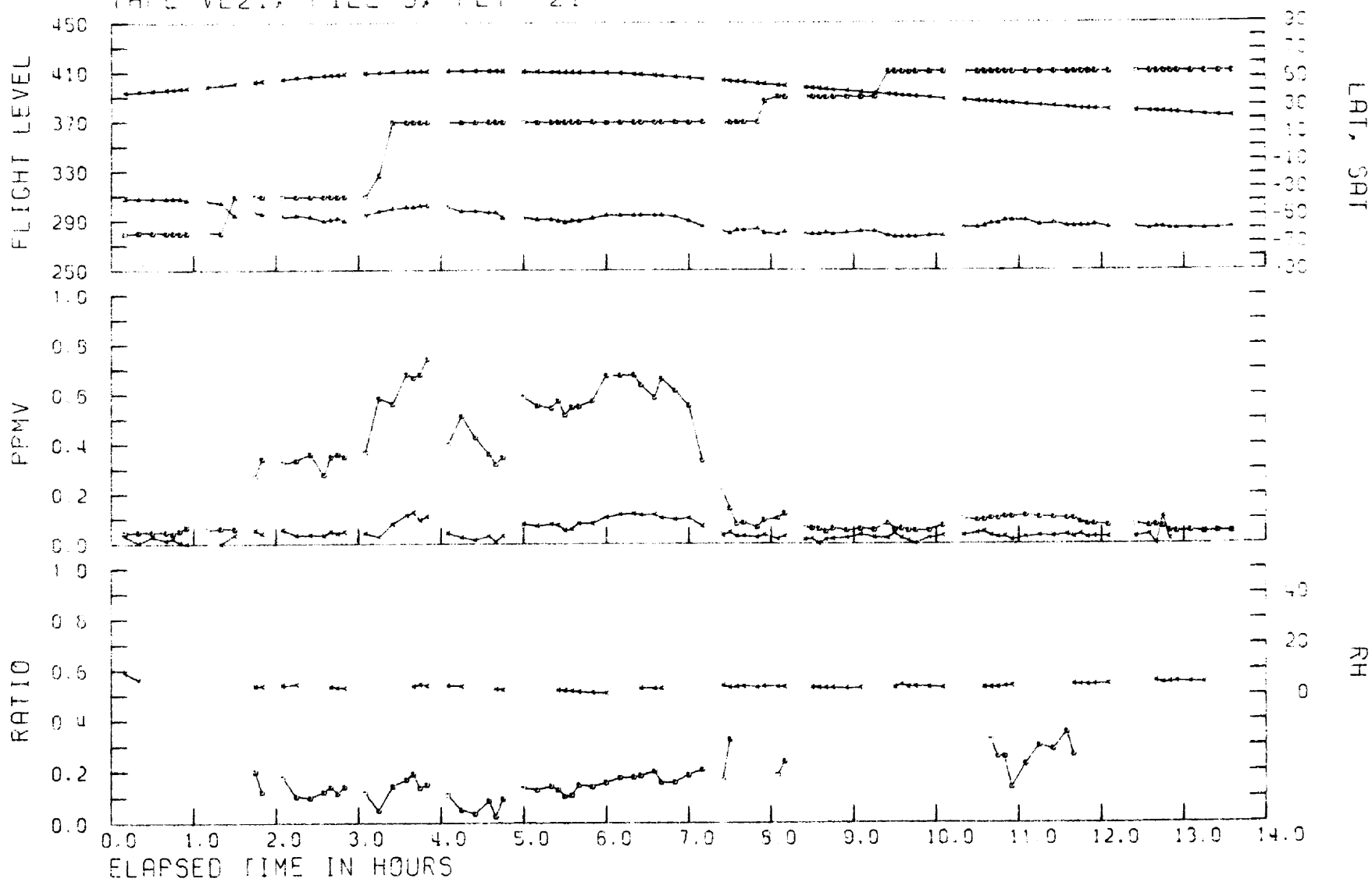
NRT TO SFO DEPARTURE 7 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 20



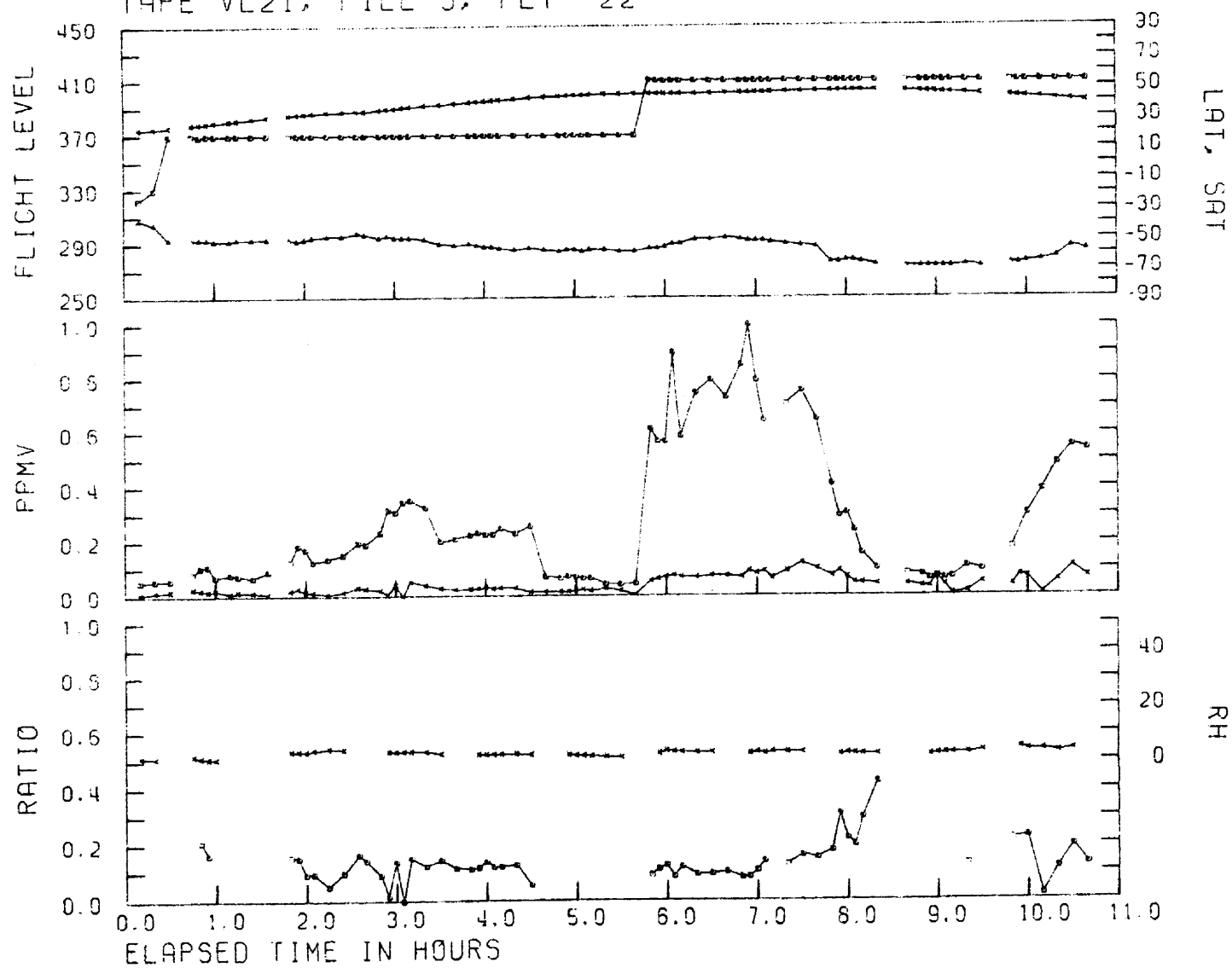
B-235

SFO TO HKG DEPARTURE 7 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 21

B-236



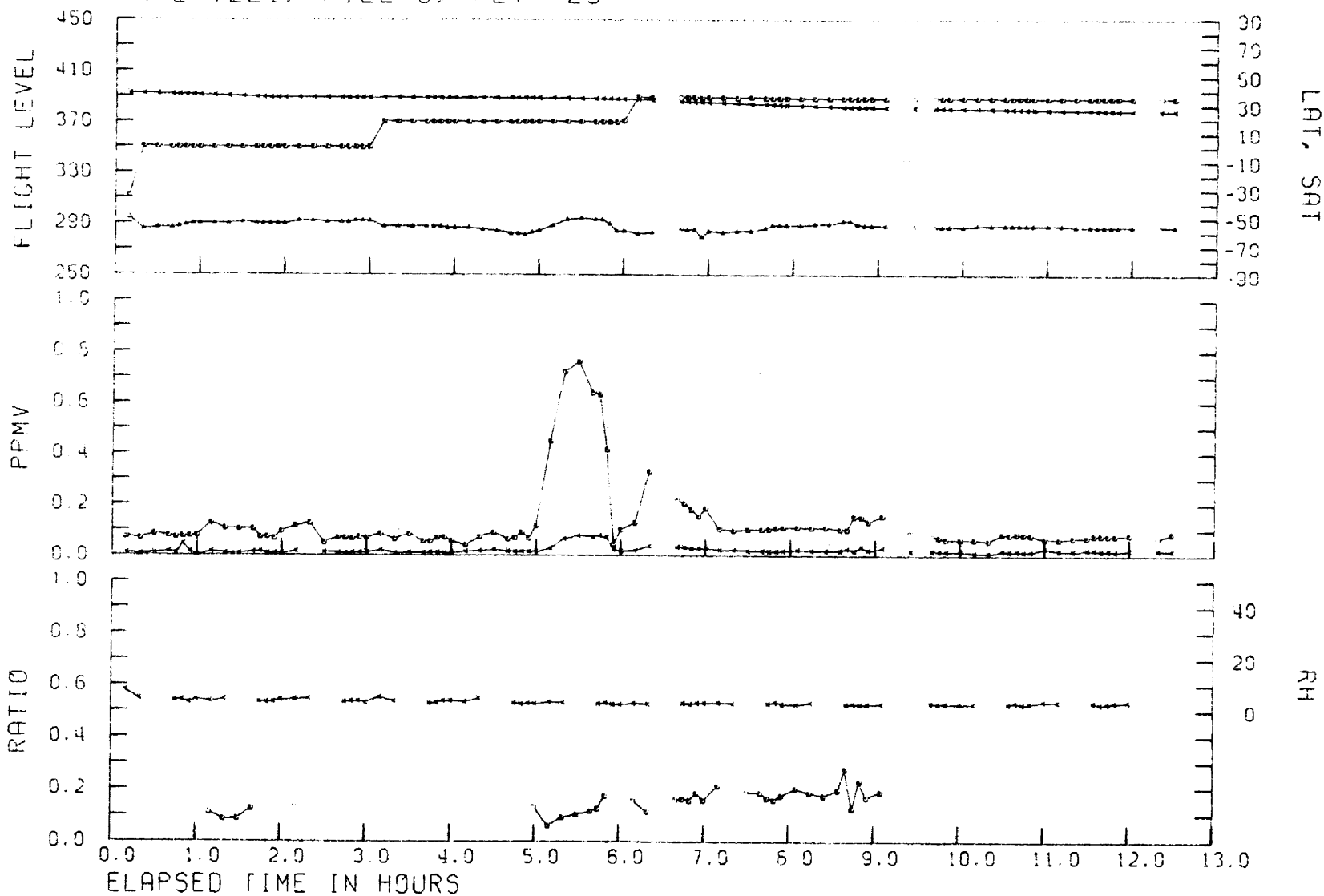
HKG TO SFO DEPARTURE 9 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 22



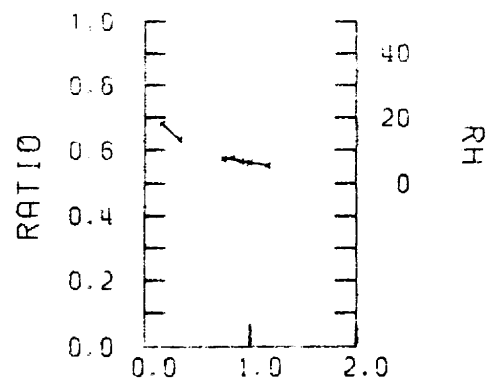
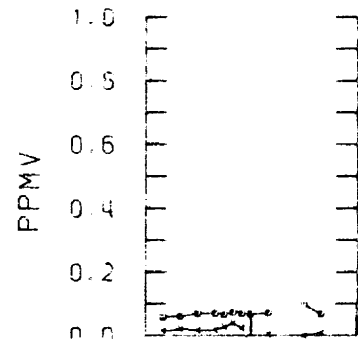
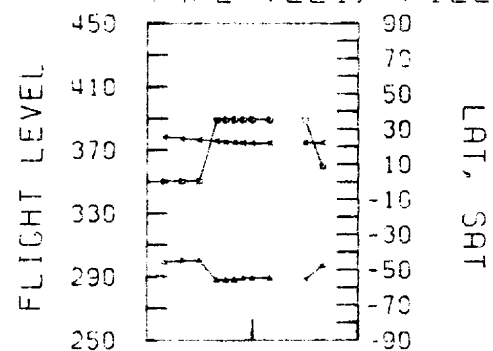
B-237

SFO TO OKA DEPARTURE 9 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 23

B-238



OKA TO HKG DEPARTURE 10 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 24

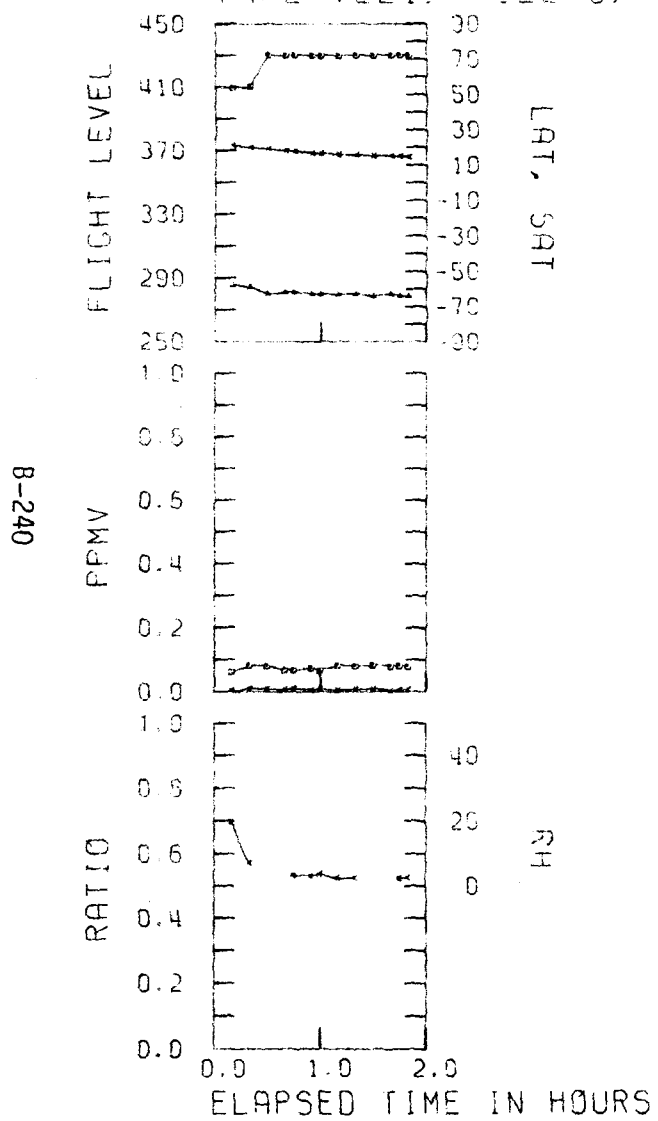


ELAPSED TIME IN HOURS

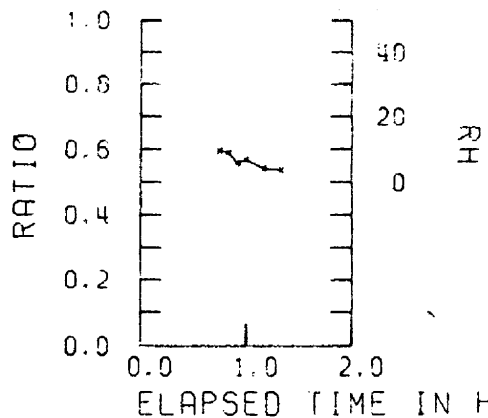
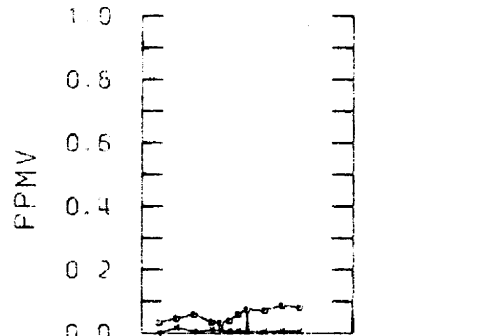
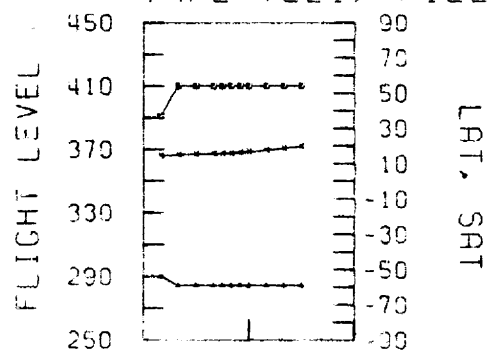
B-239

HKG TO BKK DEPARTURE 10 APR 79 PANAM -N533PA

TAPE VL21, FILE 3, FLT 25

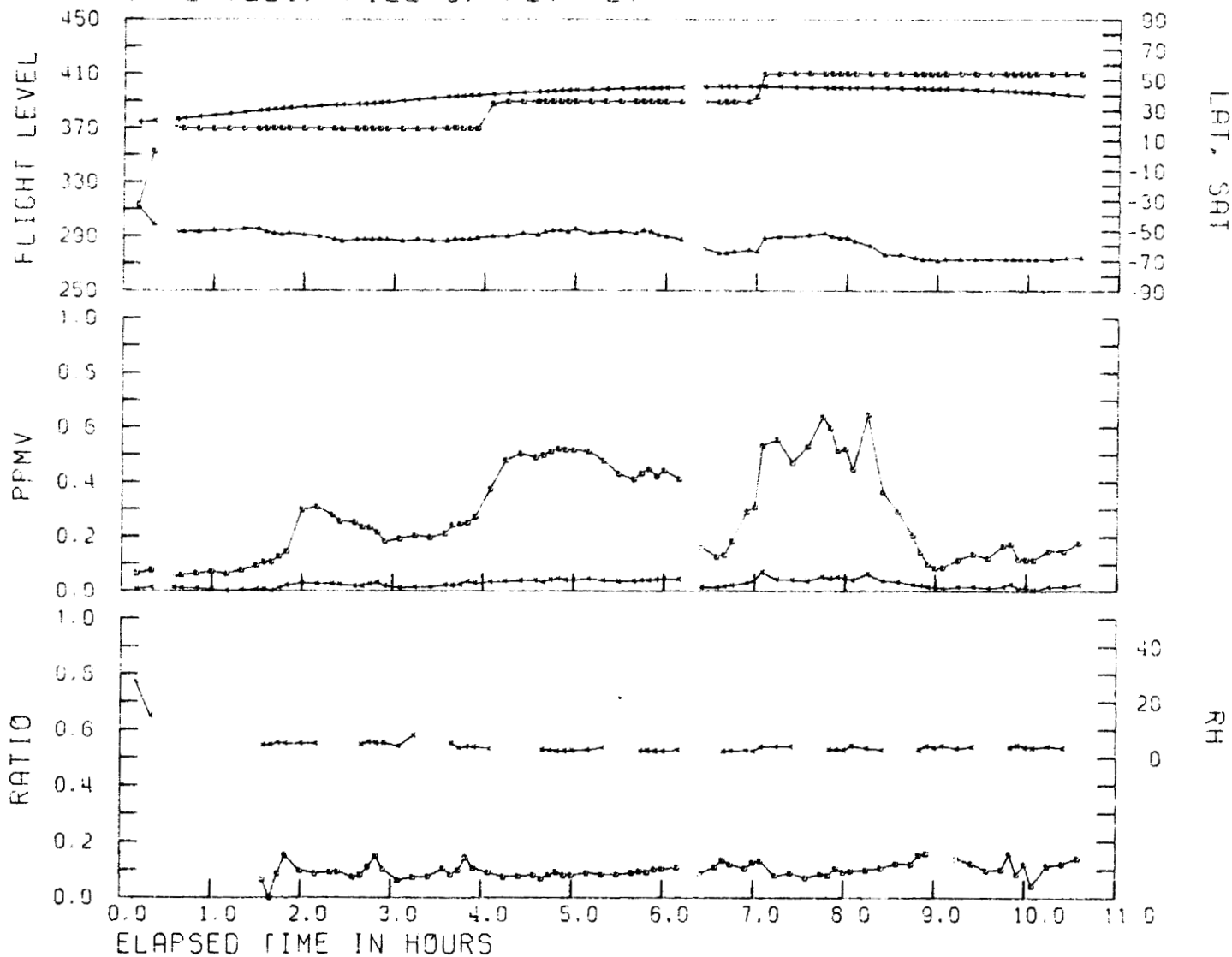


BKK TO HKG DEPARTURE 11 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 26



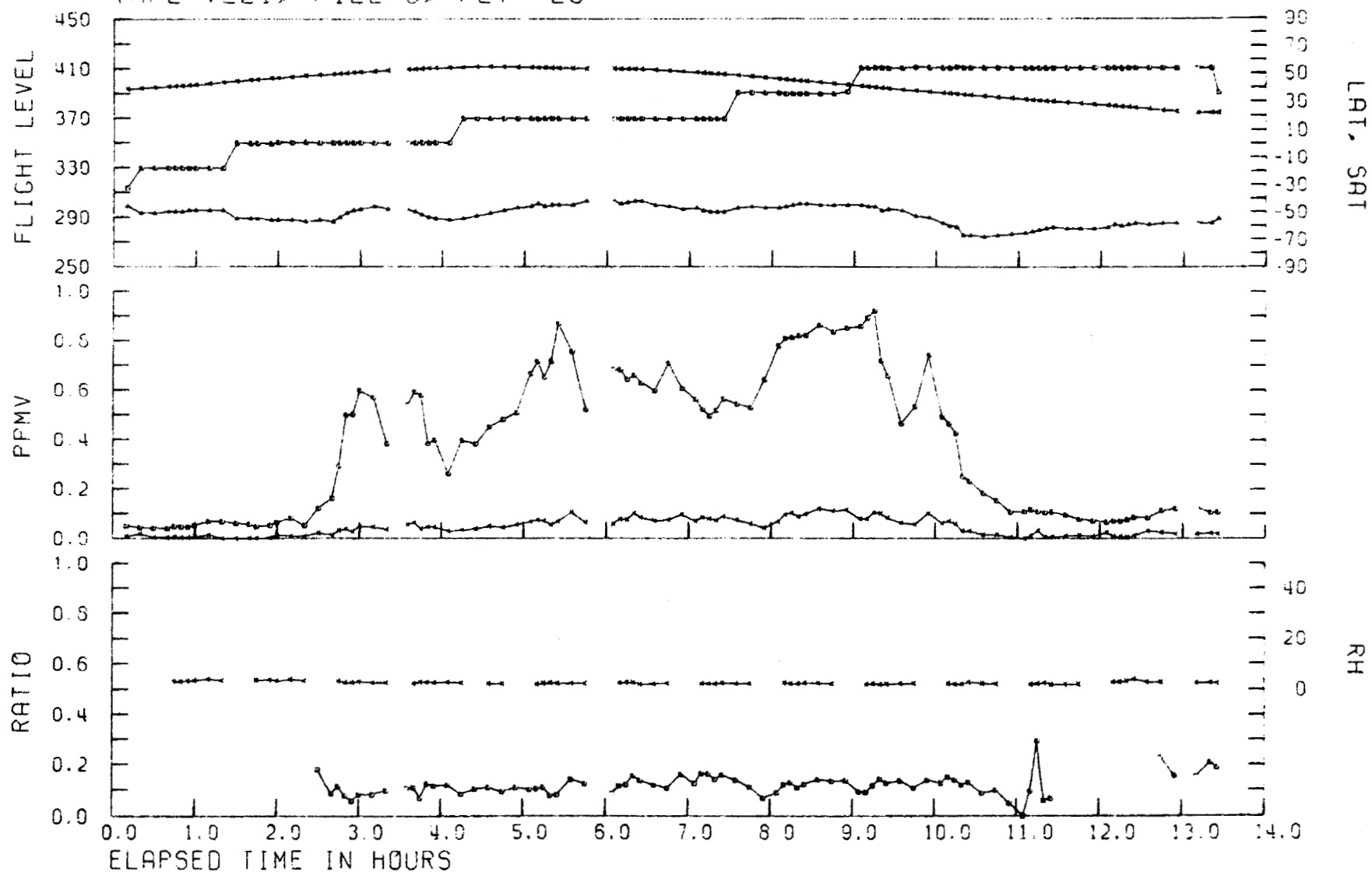
B-241

HKG TO SFO DEPARTURE 11 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 27



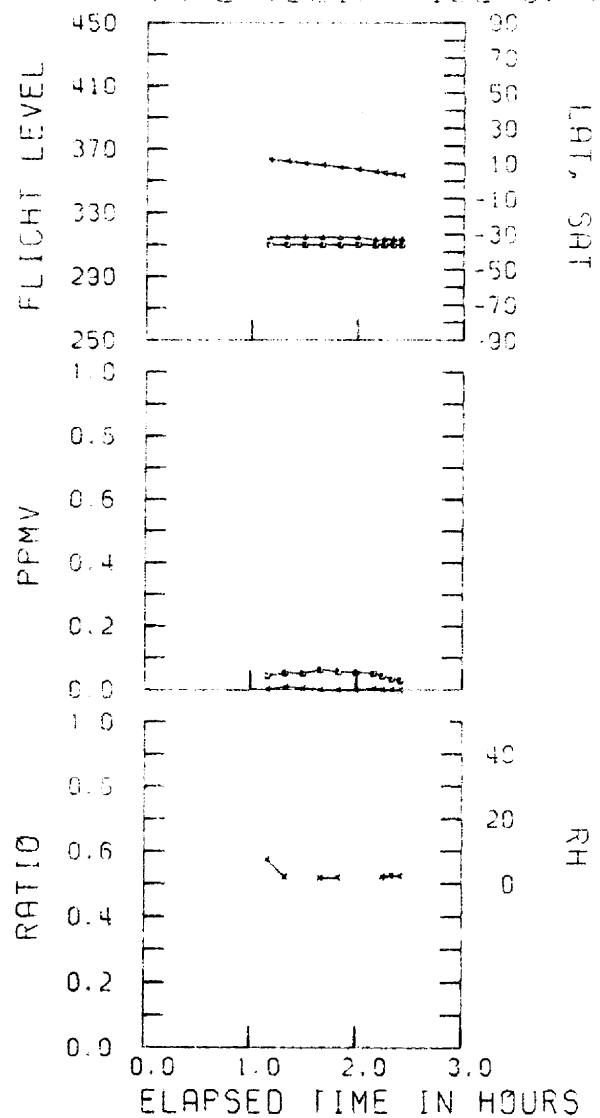
B-242

SFO TO HKG DEPARTURE 11 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 28



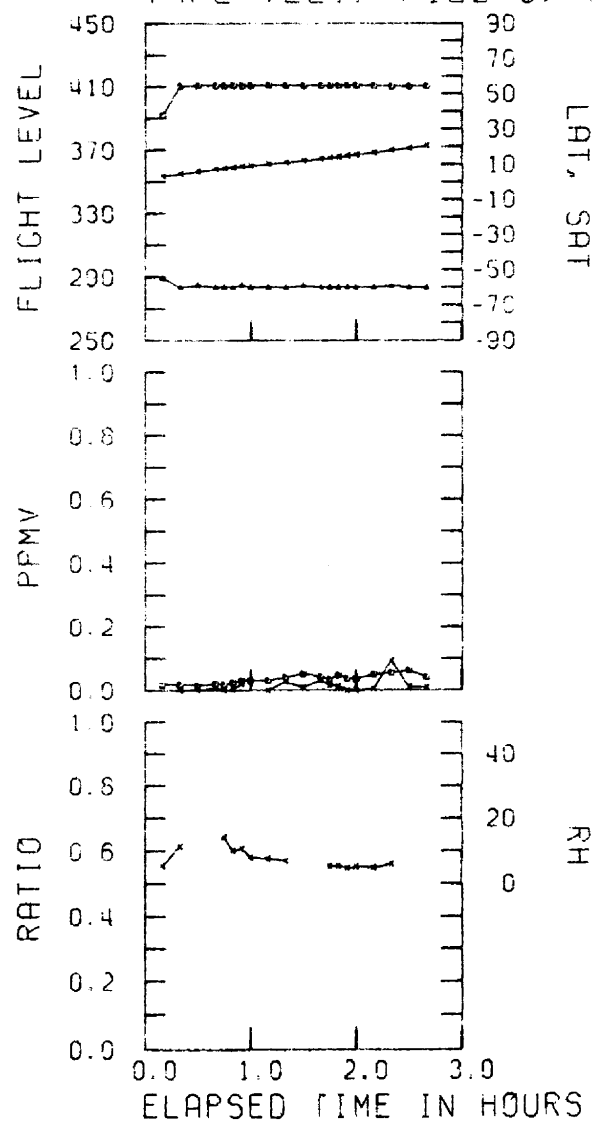
B-243

HKG TO SIN DEPARTURE 12 APR 79 PANAM -N533FA
 TAPE VL21, FILE 3, FLT 29



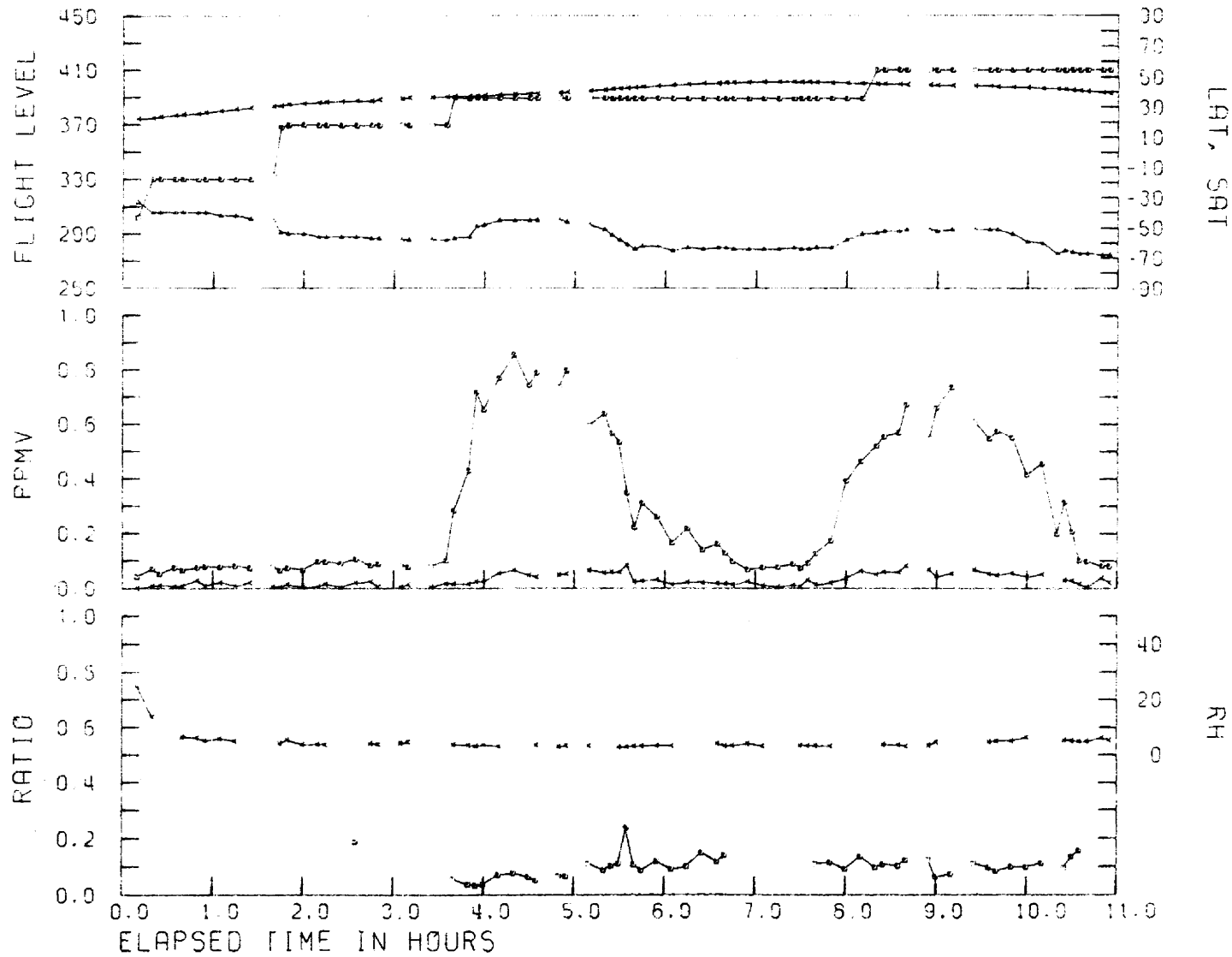
B-244

SIN TO HKG DEPARTURE 13 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 30



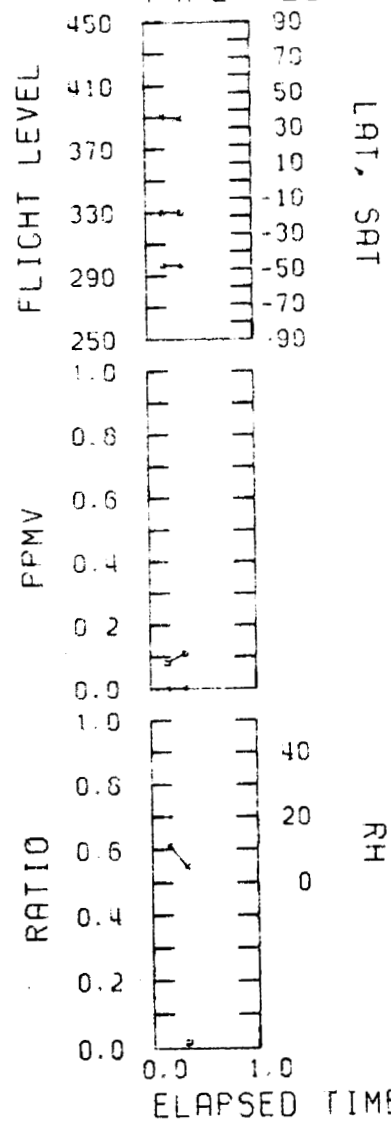
B-245

HKG TO SFO DEPARTURE 13 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 31

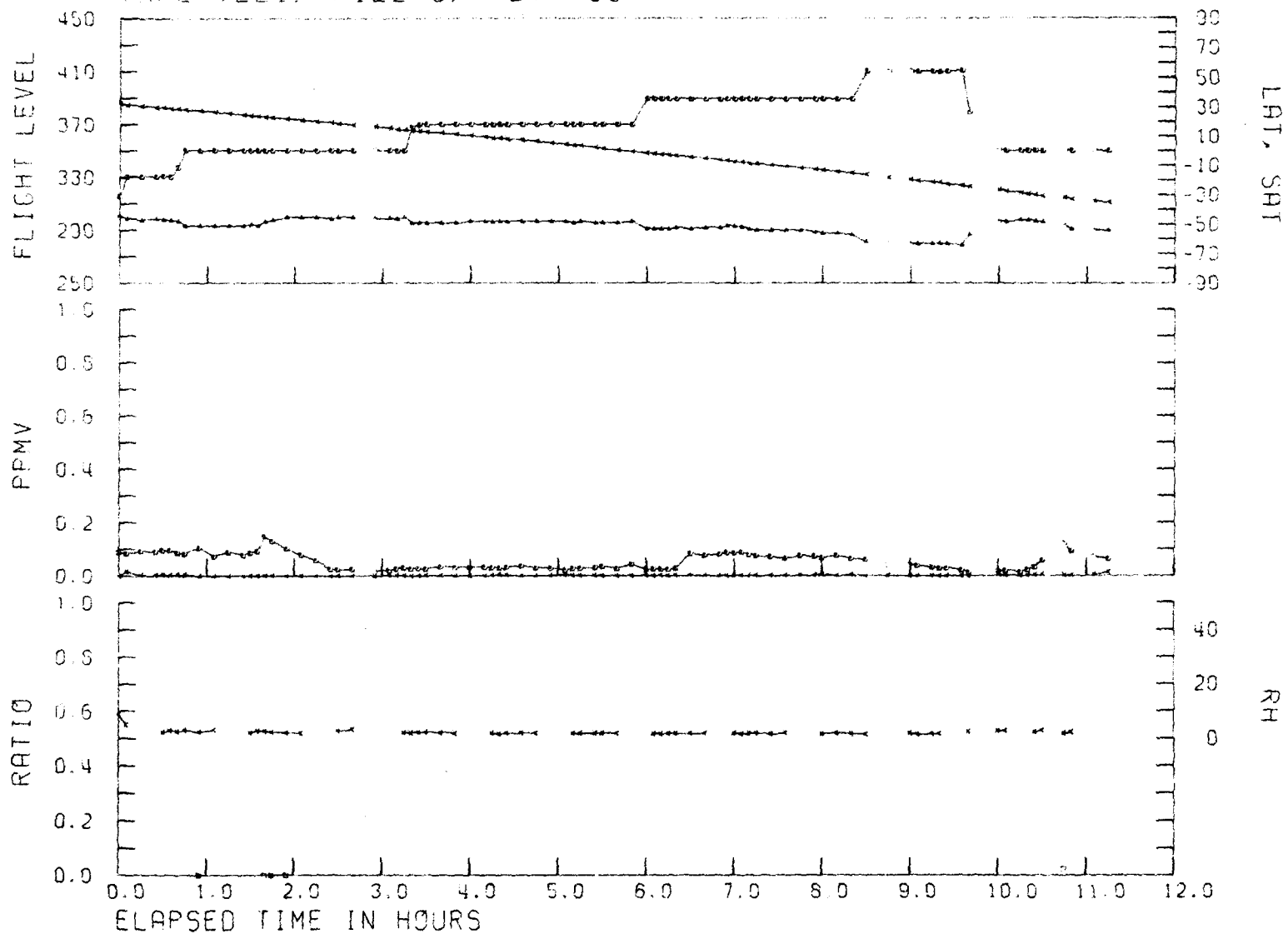


B-246

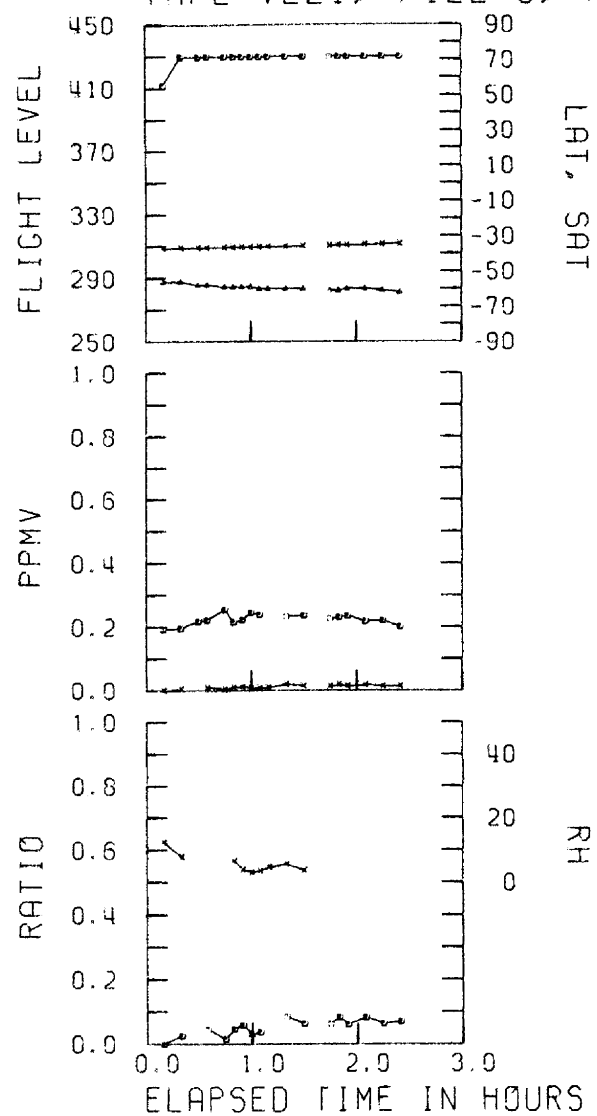
SFO TO LAX DEPARTURE 14 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 32



LAX TO AKL DEPARTURE 14 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 33

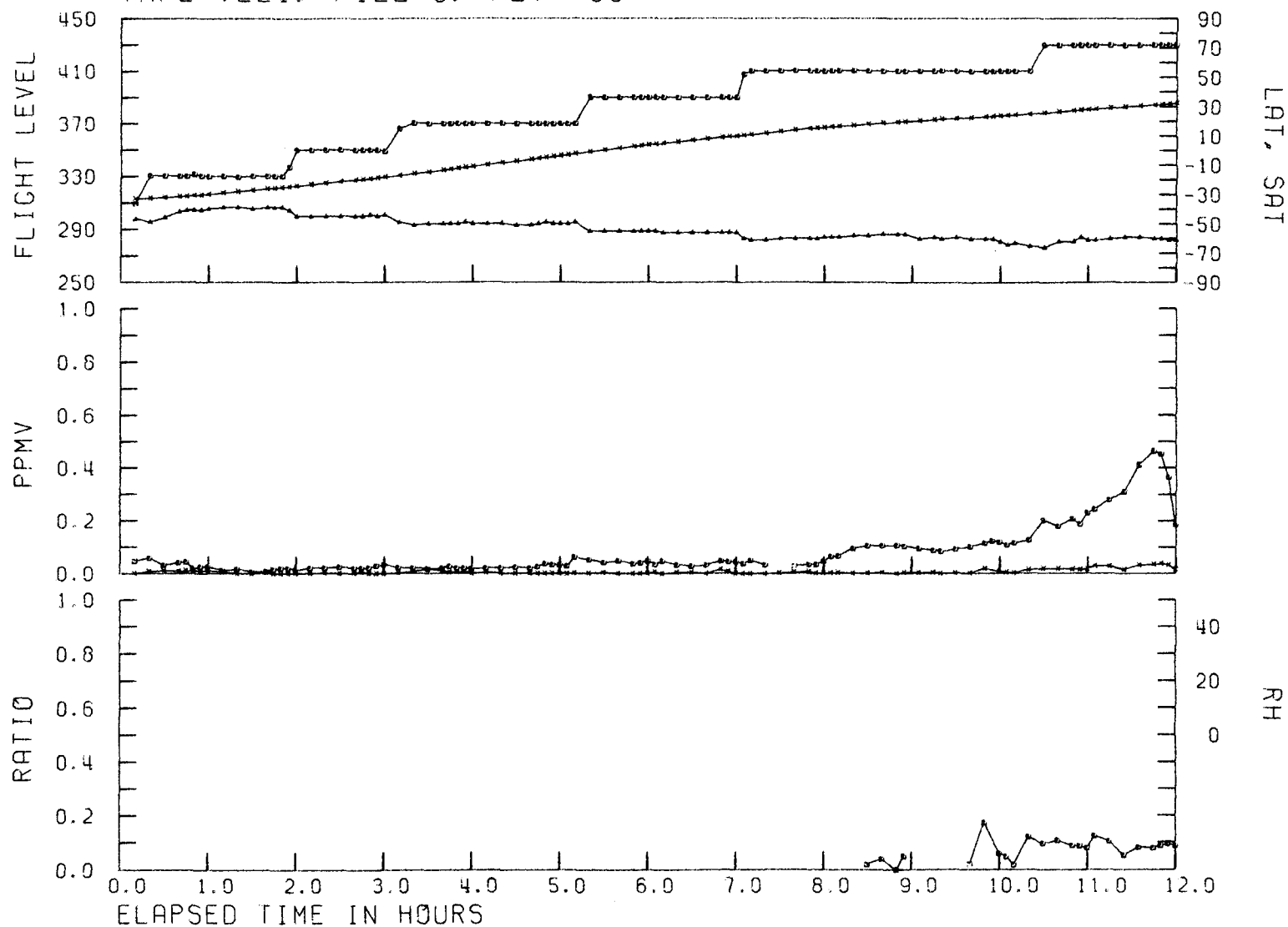


AKL TO SYD DEPARTURE 14 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 34

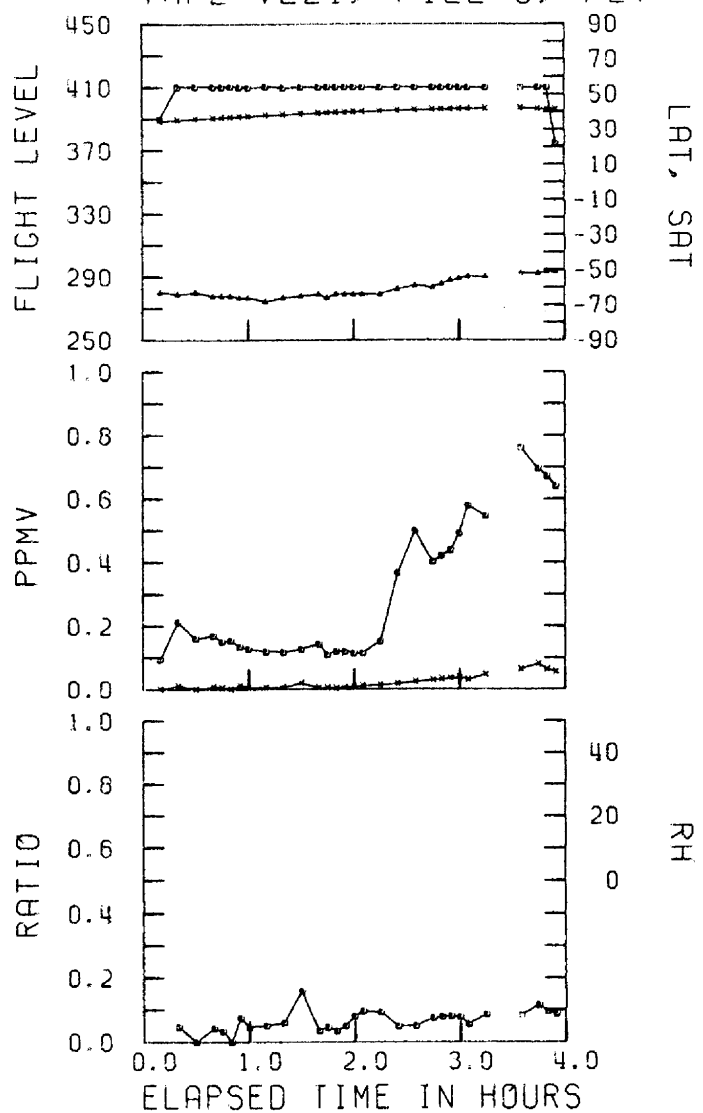


SYD TO LAX DEPARTURE 15 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 35

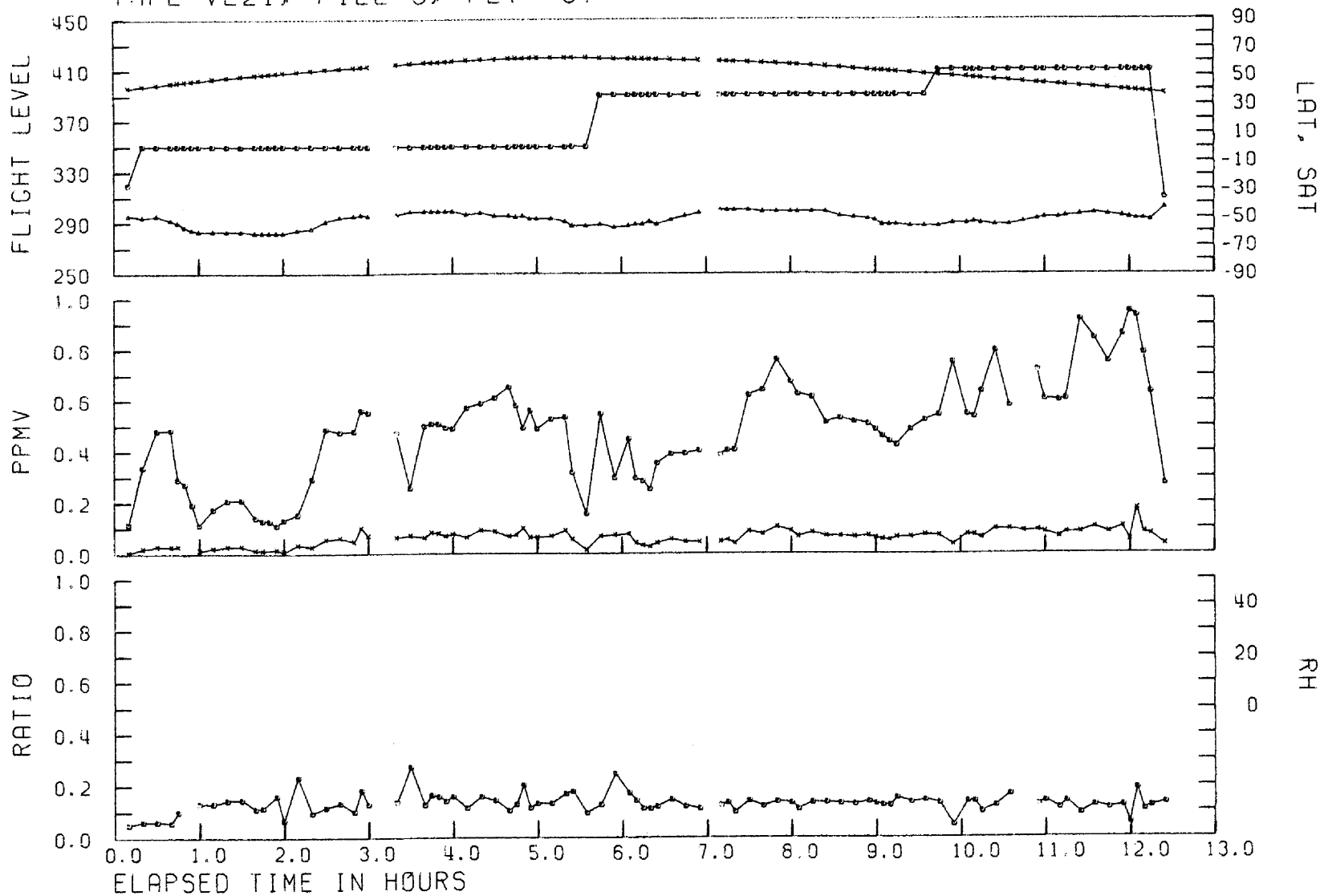
B-250



LAX TO JFK DEPARTURE 15 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 36

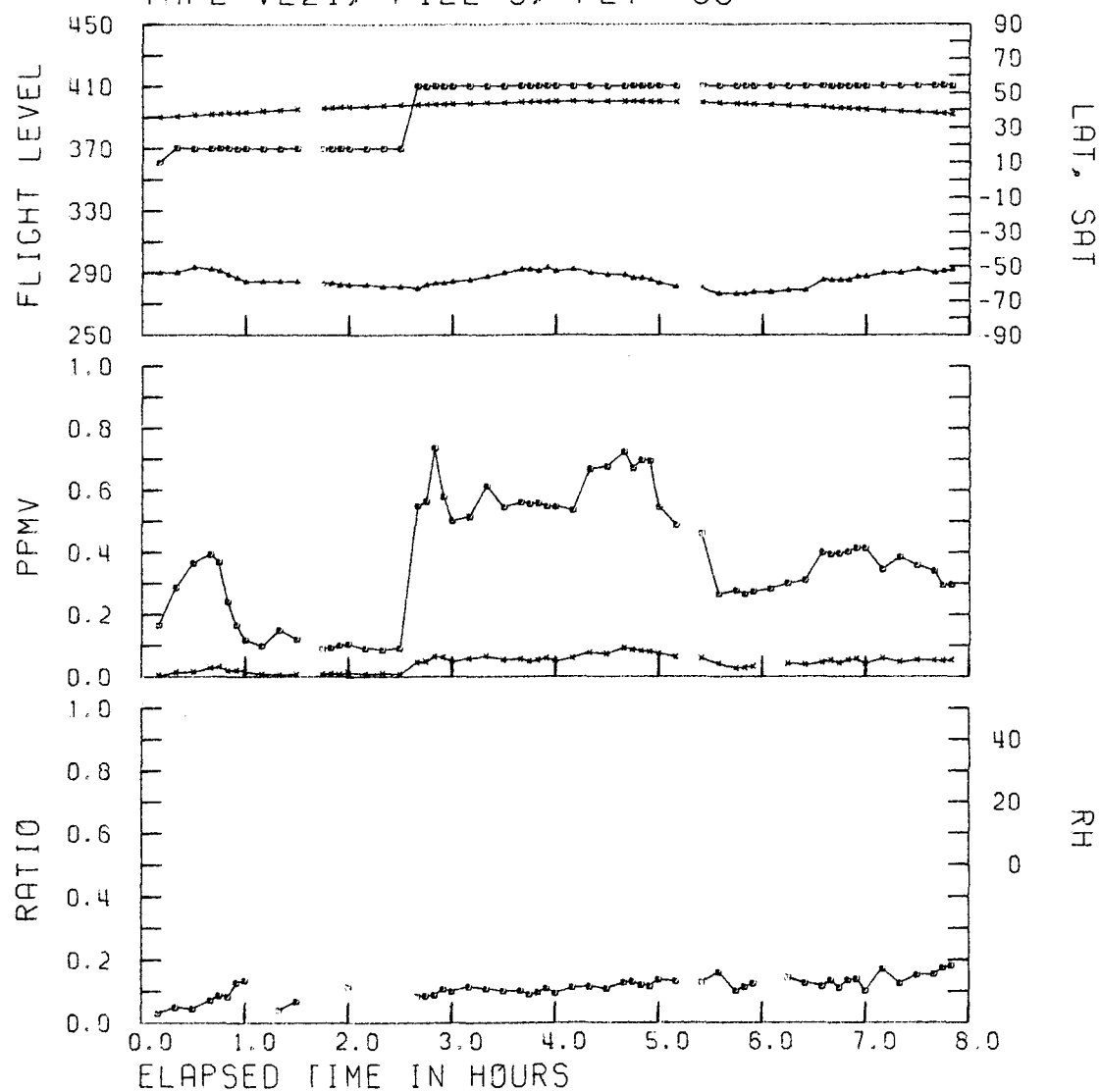


JFK TO NRT DEPARTURE 16 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 37

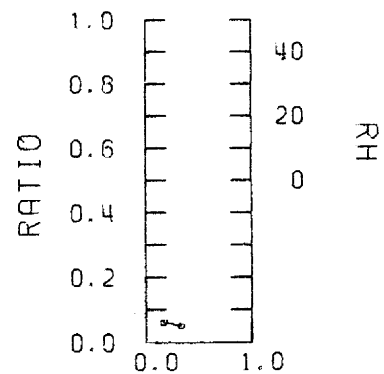
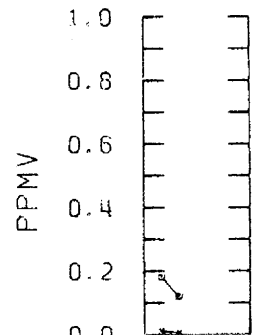
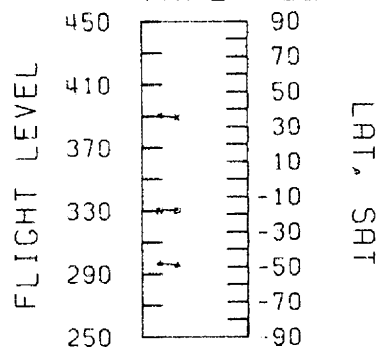


NRT TO SFO DEPARTURE 17 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 38

B-253



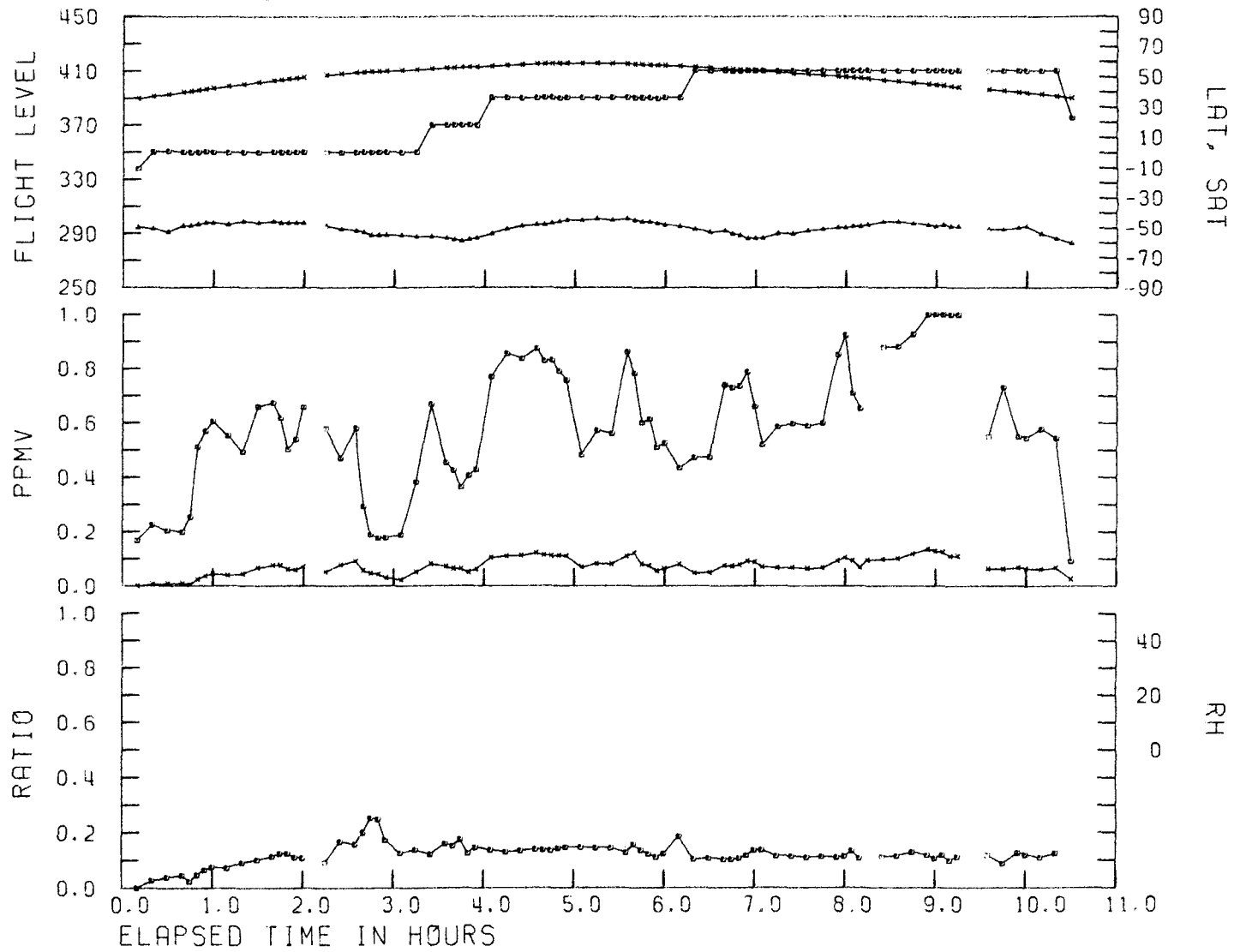
SFO TO LAX DEPARTURE 17 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 39



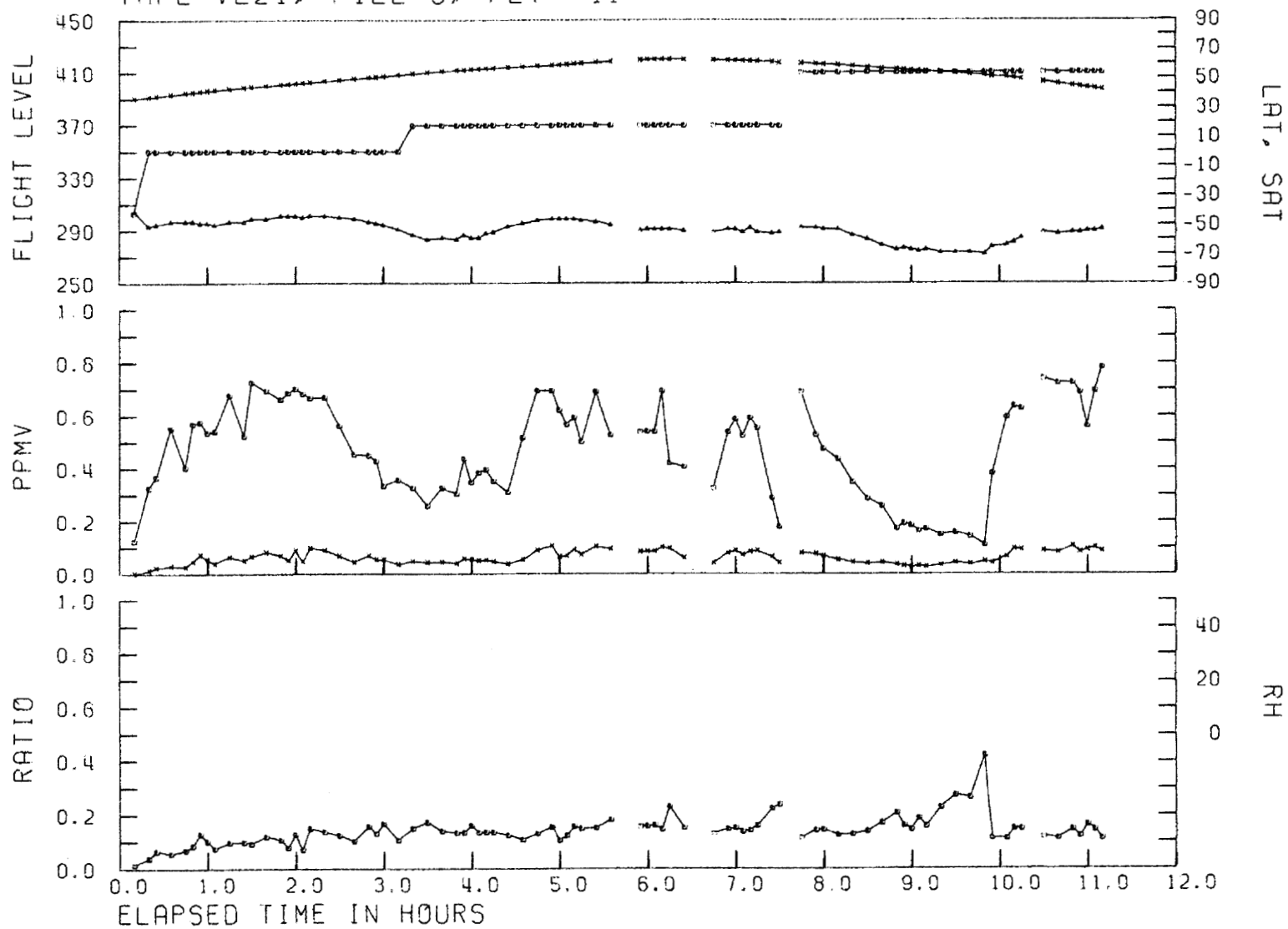
ELAPSED TIME IN HOURS

B-254

LAX TO NRT DEPARTURE 17 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 40

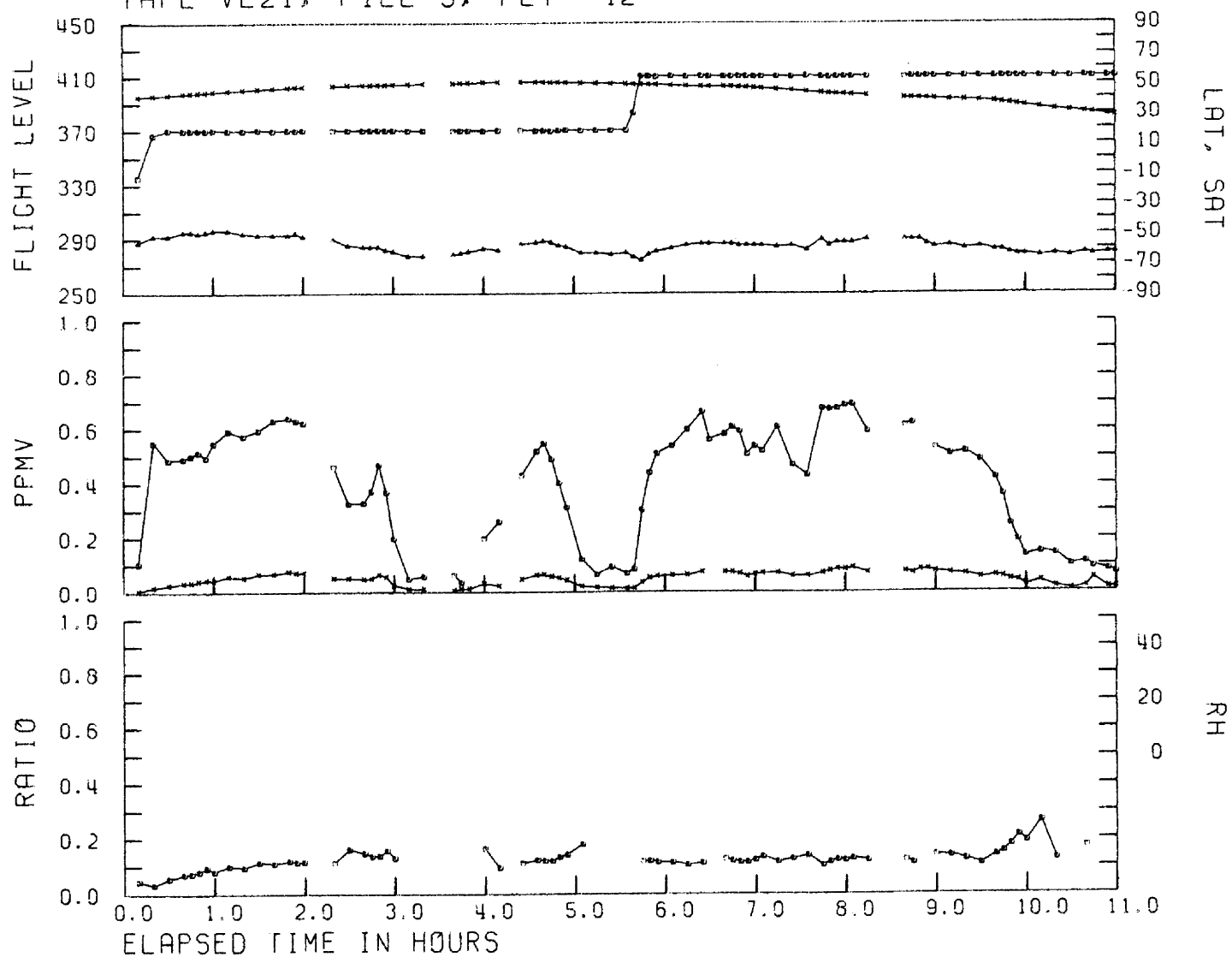


NRT TO JFK DEPARTURE 18 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 41



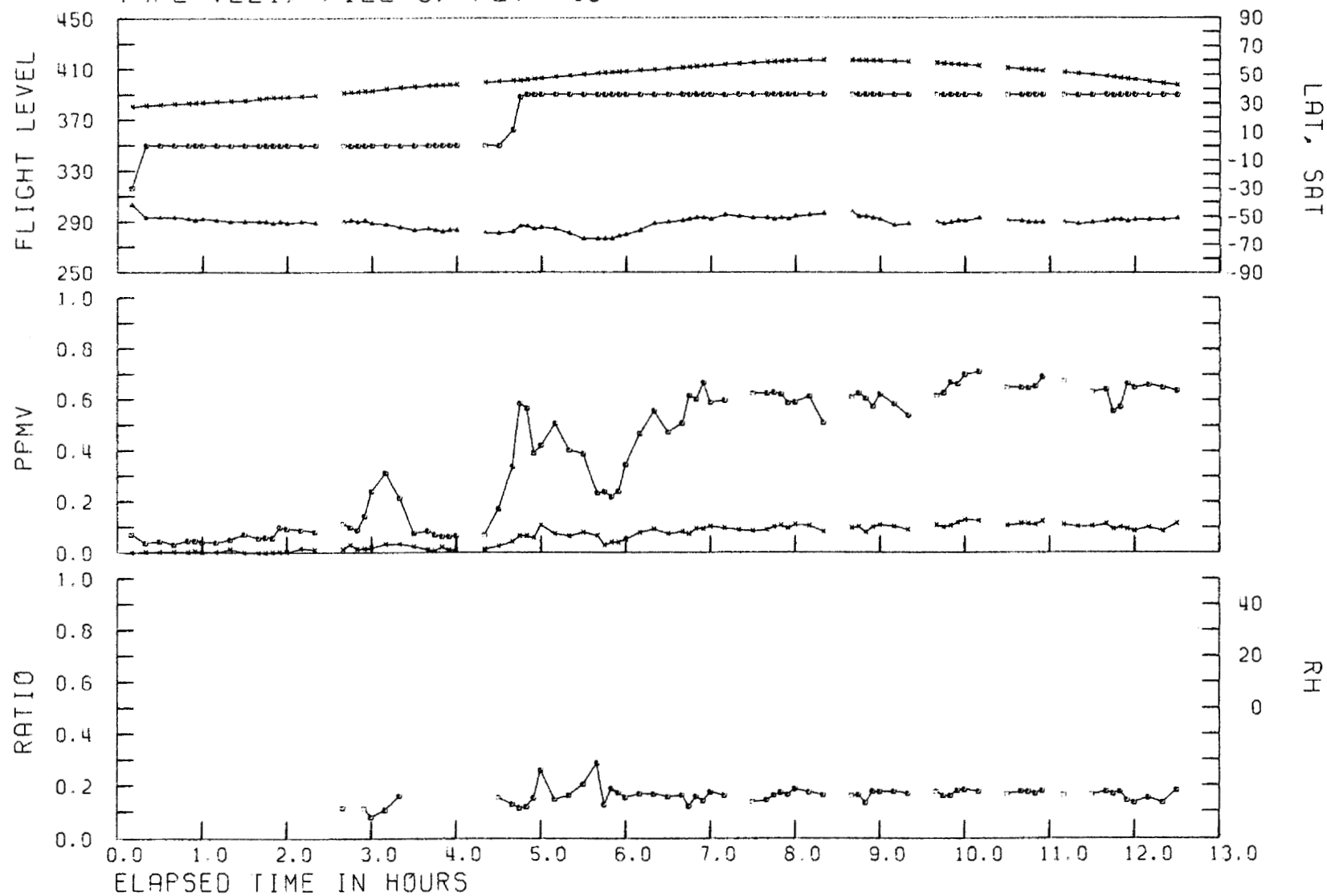
B-256

JFK TO DHA DEPARTURE 19 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 42



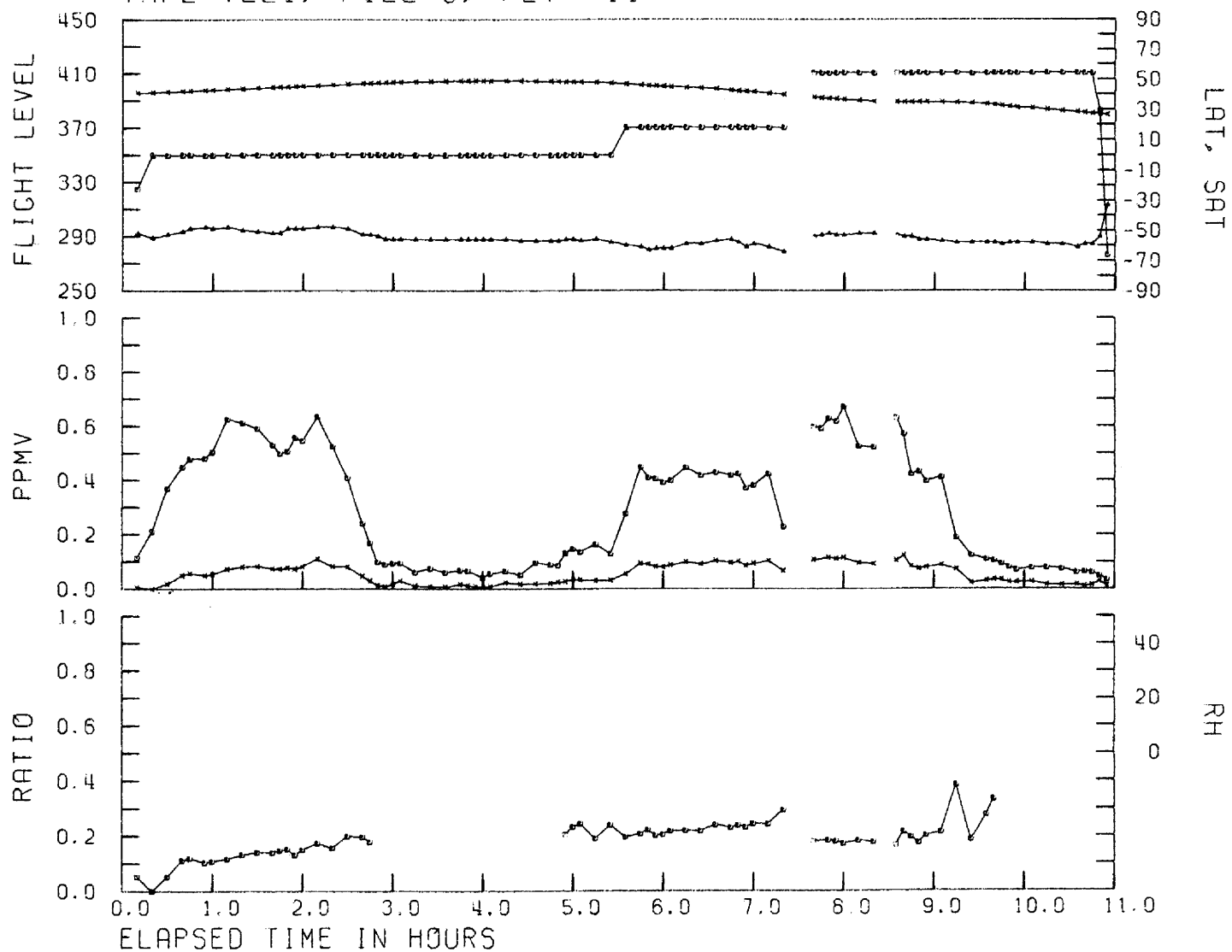
B-257

DHA TO JFK DEPARTURE 19 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 43

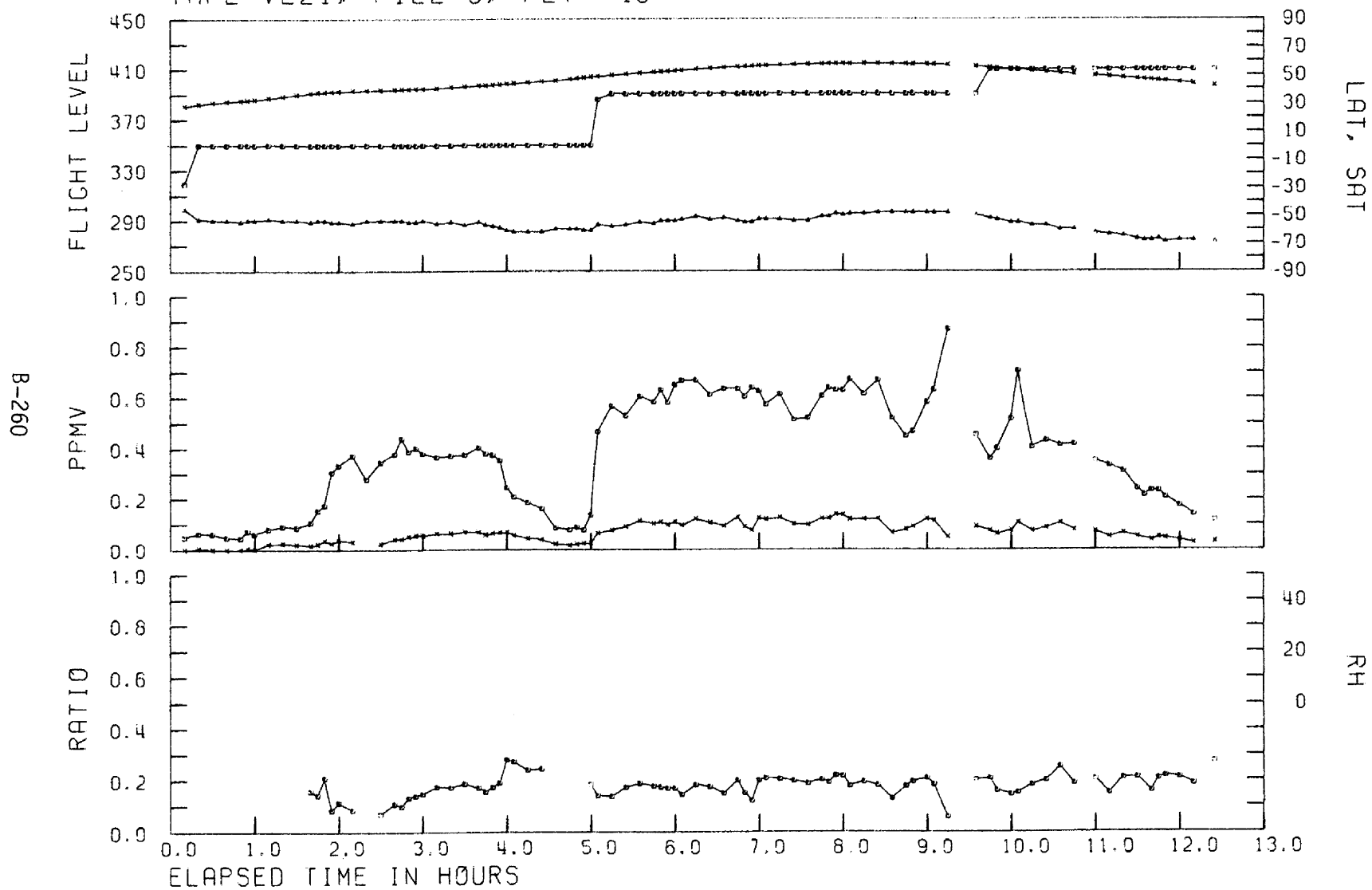


JFK TO DHA DEPARTURE 21 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 44

B-259

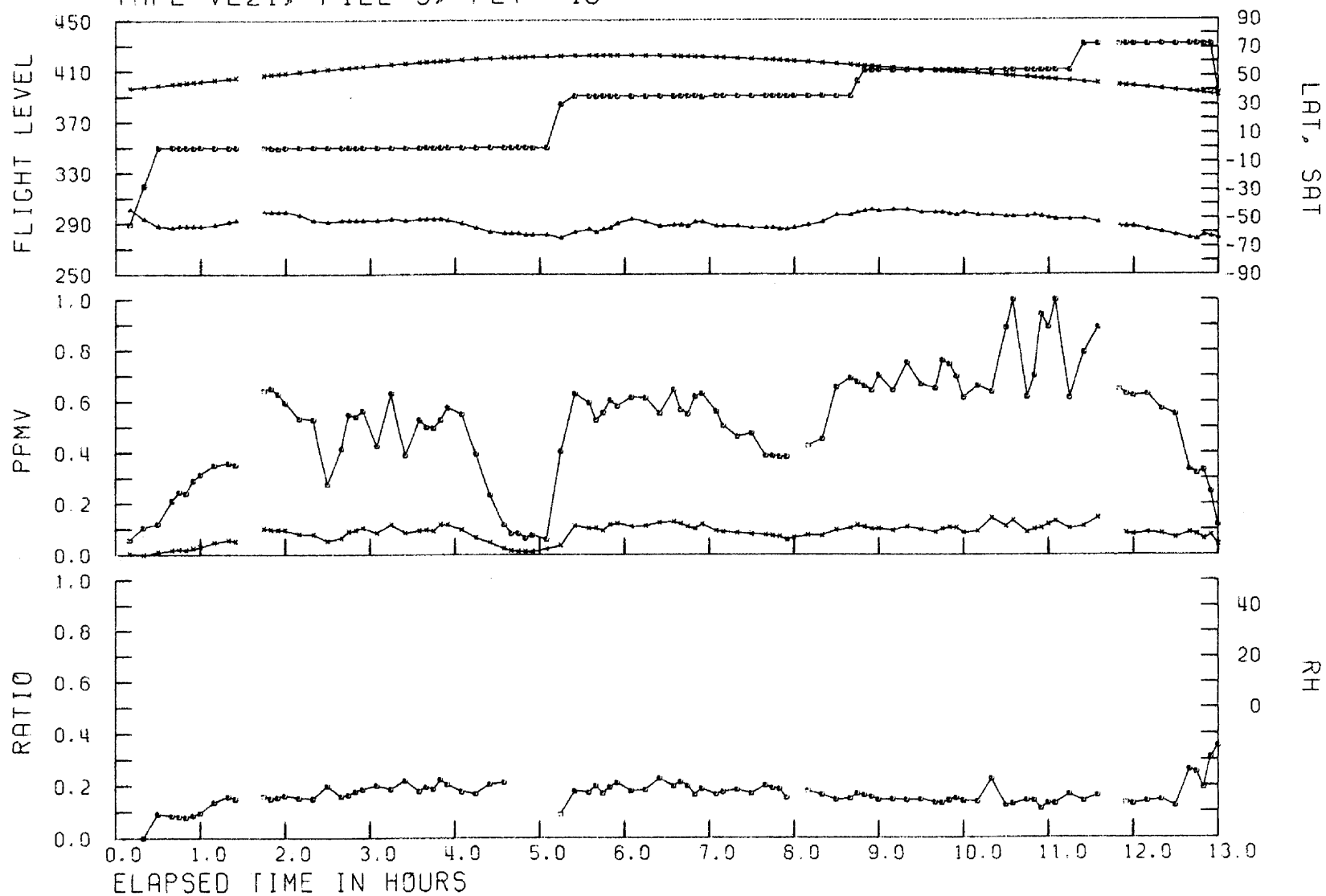


DHA TO JFK DEPARTURE 21 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 45

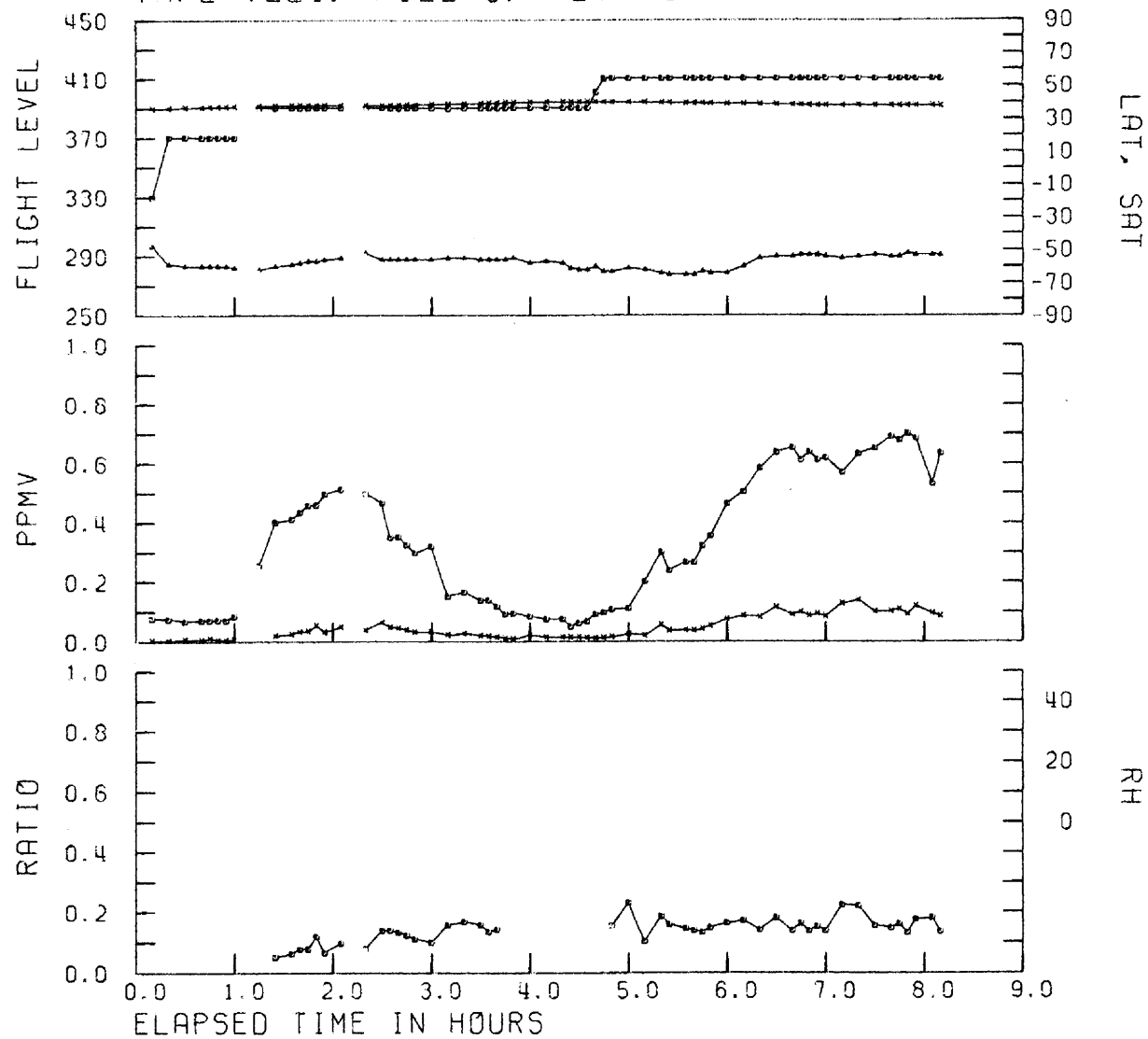


JFK TO NRT DEPARTURE 22 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 46

B-261



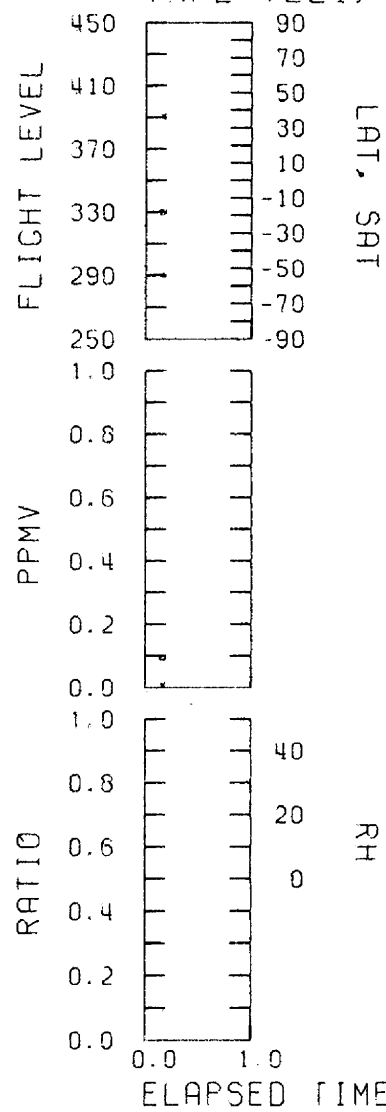
NRT TO SFO DEPARTURE 23 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 47



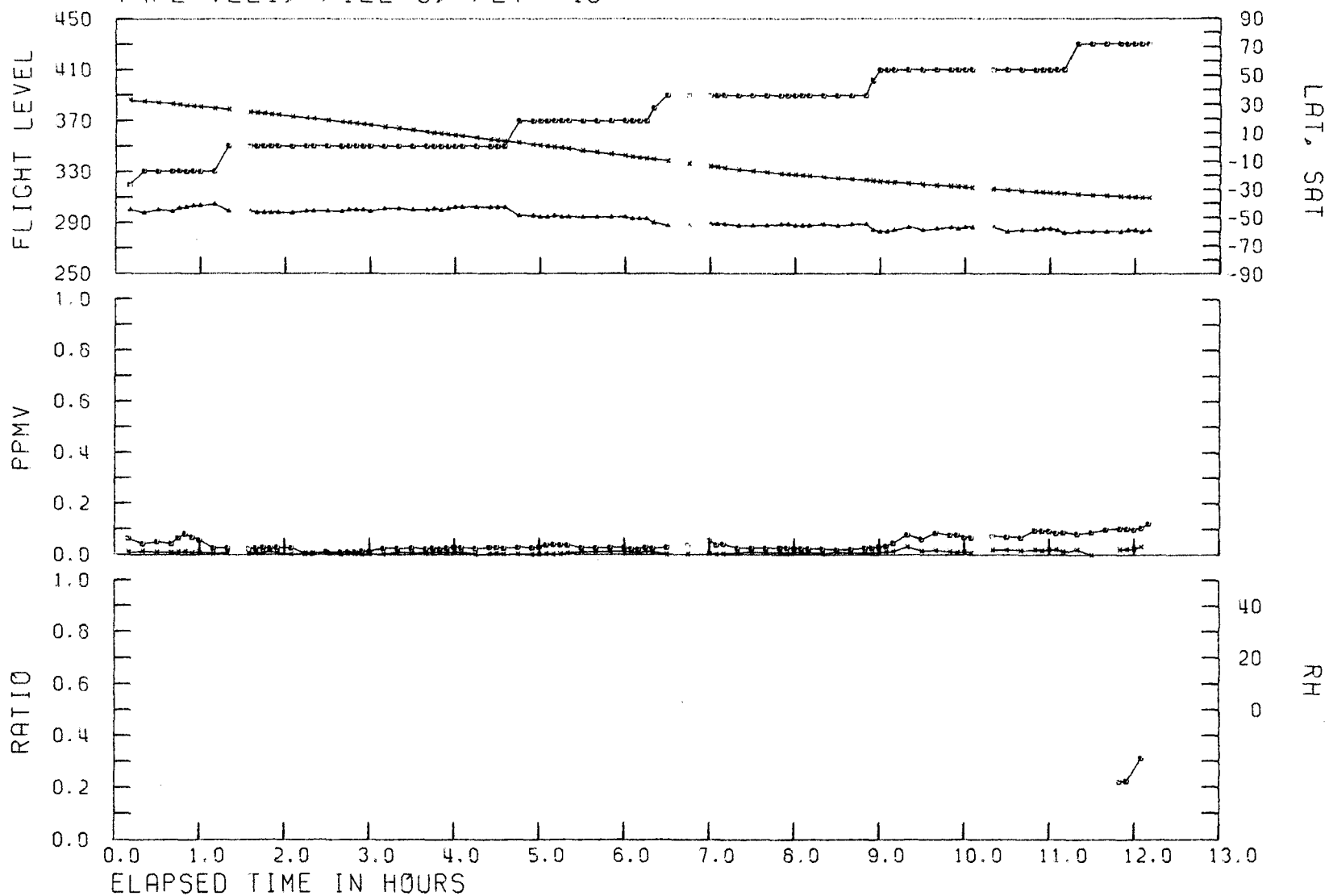
SFO TO LAX DEPARTURE 23 APR 79 PANAM -N533PA

TAPE VL21, FILE 3, FLT 48

B-263



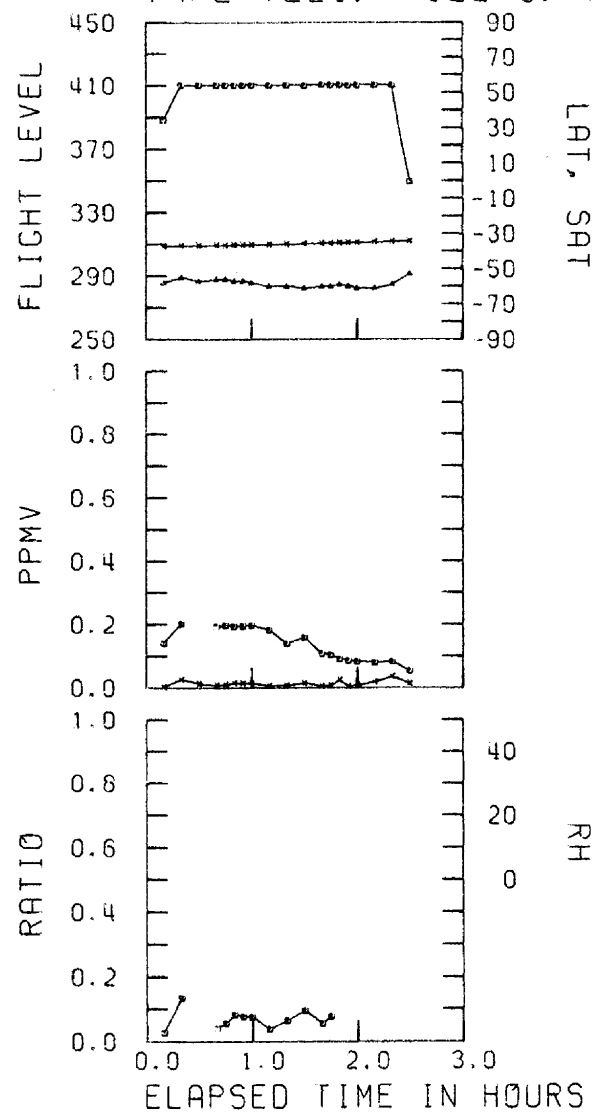
LAX TO AKL DEPARTURE 24 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 49



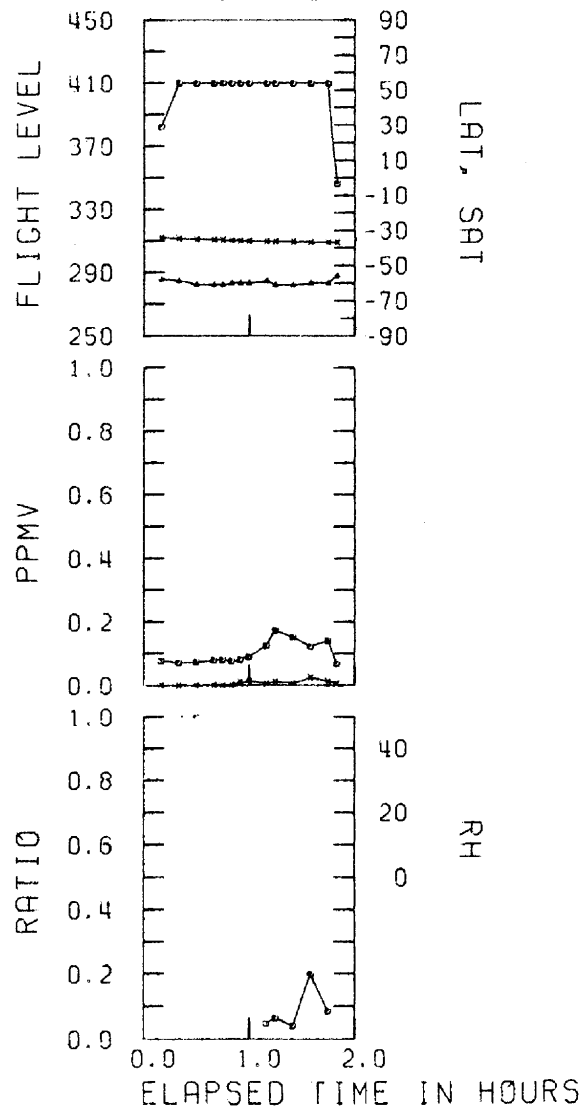
B-264

AKL TO SYD DEPARTURE 24 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 50

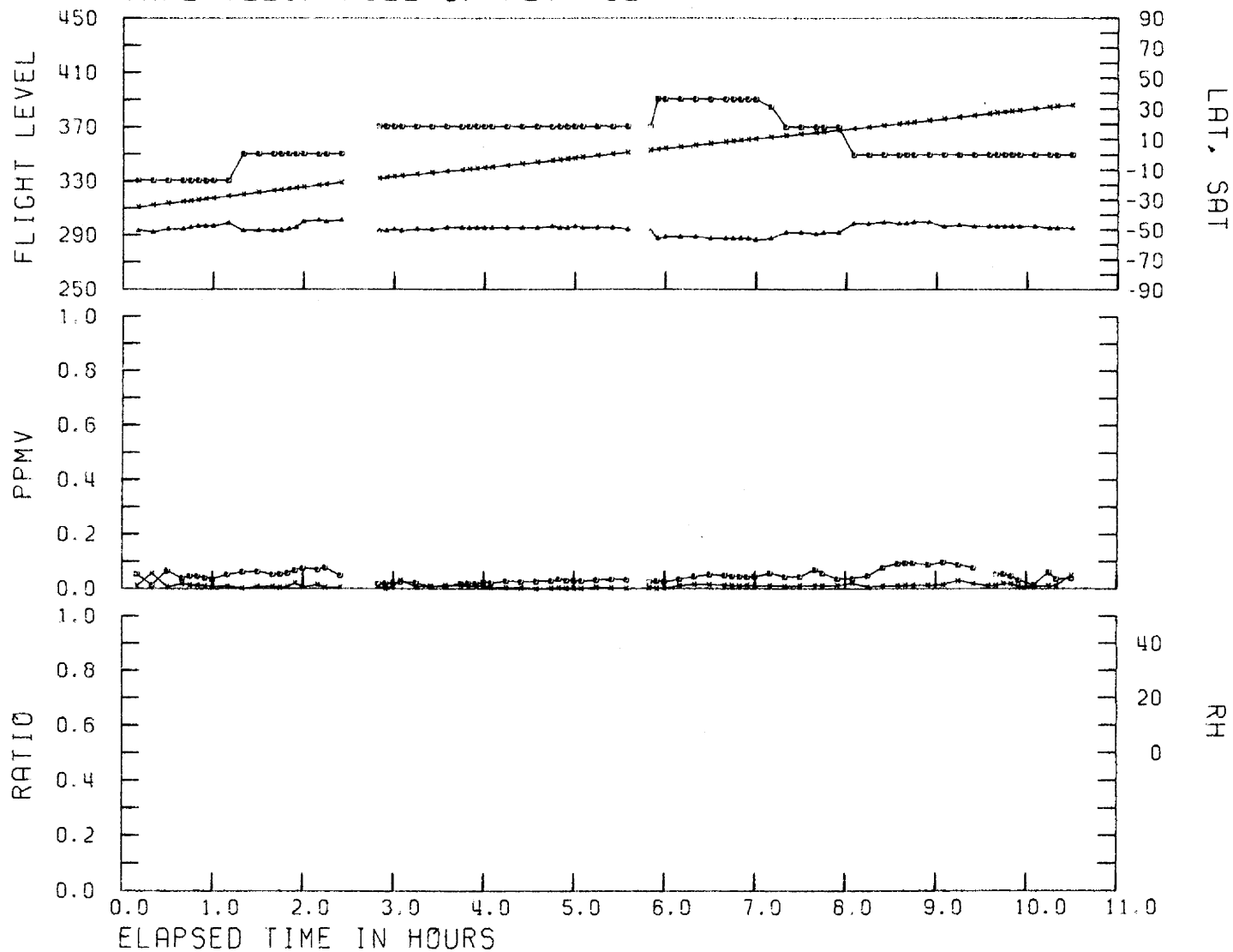
B-265



SYD TO AKL DEPARTURE 25 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 51

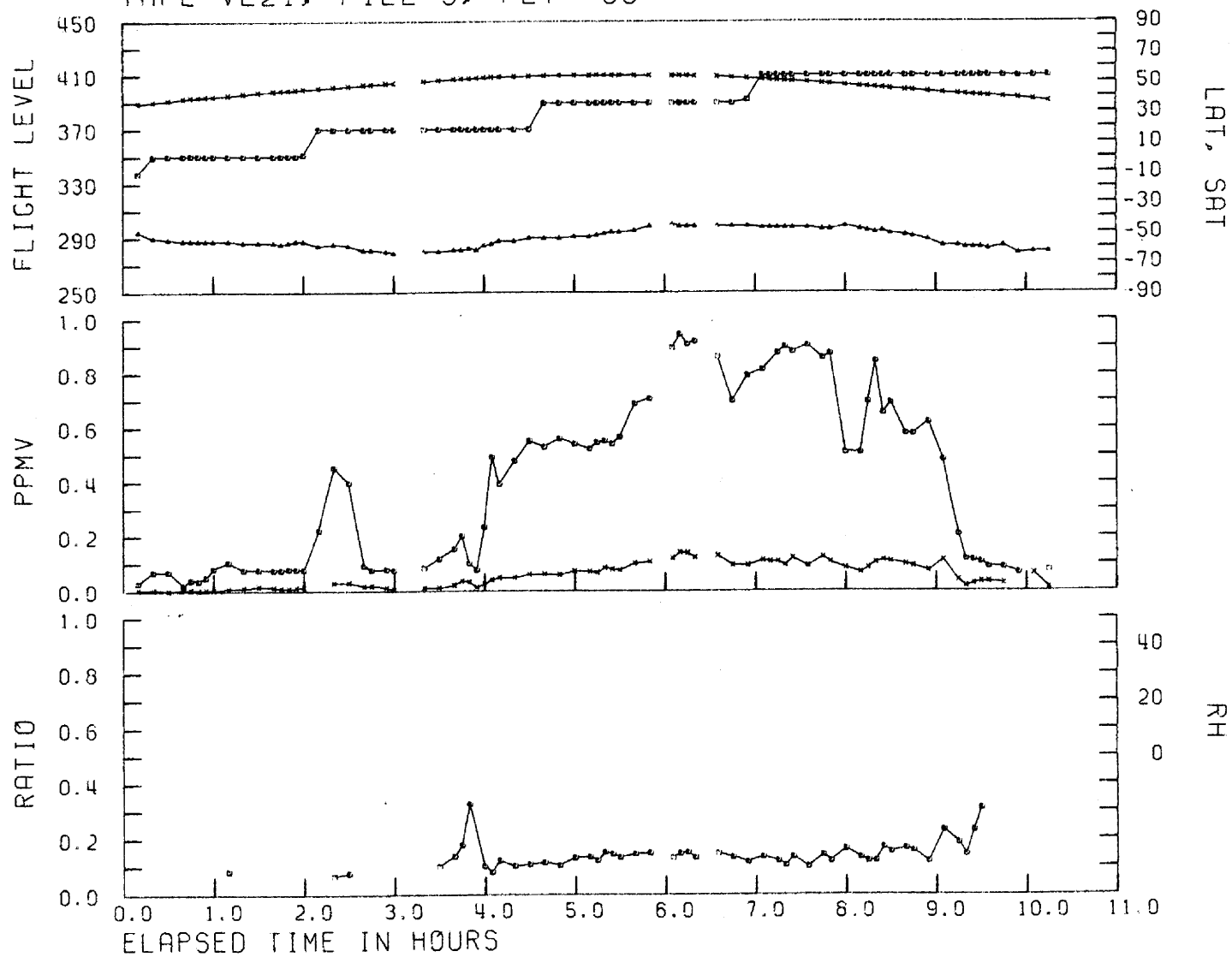


AKL TO LAX DEPARTURE 25 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 52



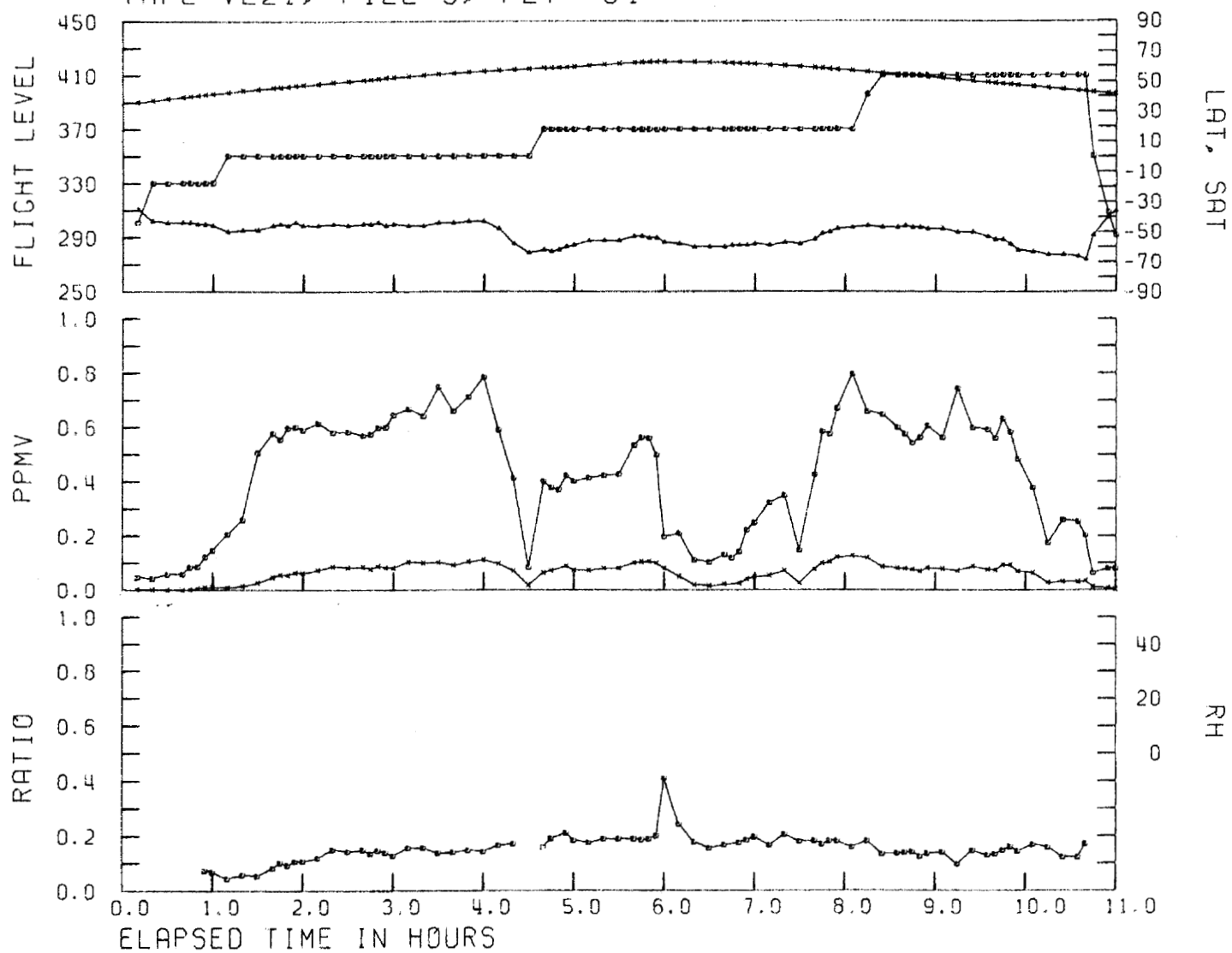
B-267

LAX TO NRT DEPARTURE 25 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 53

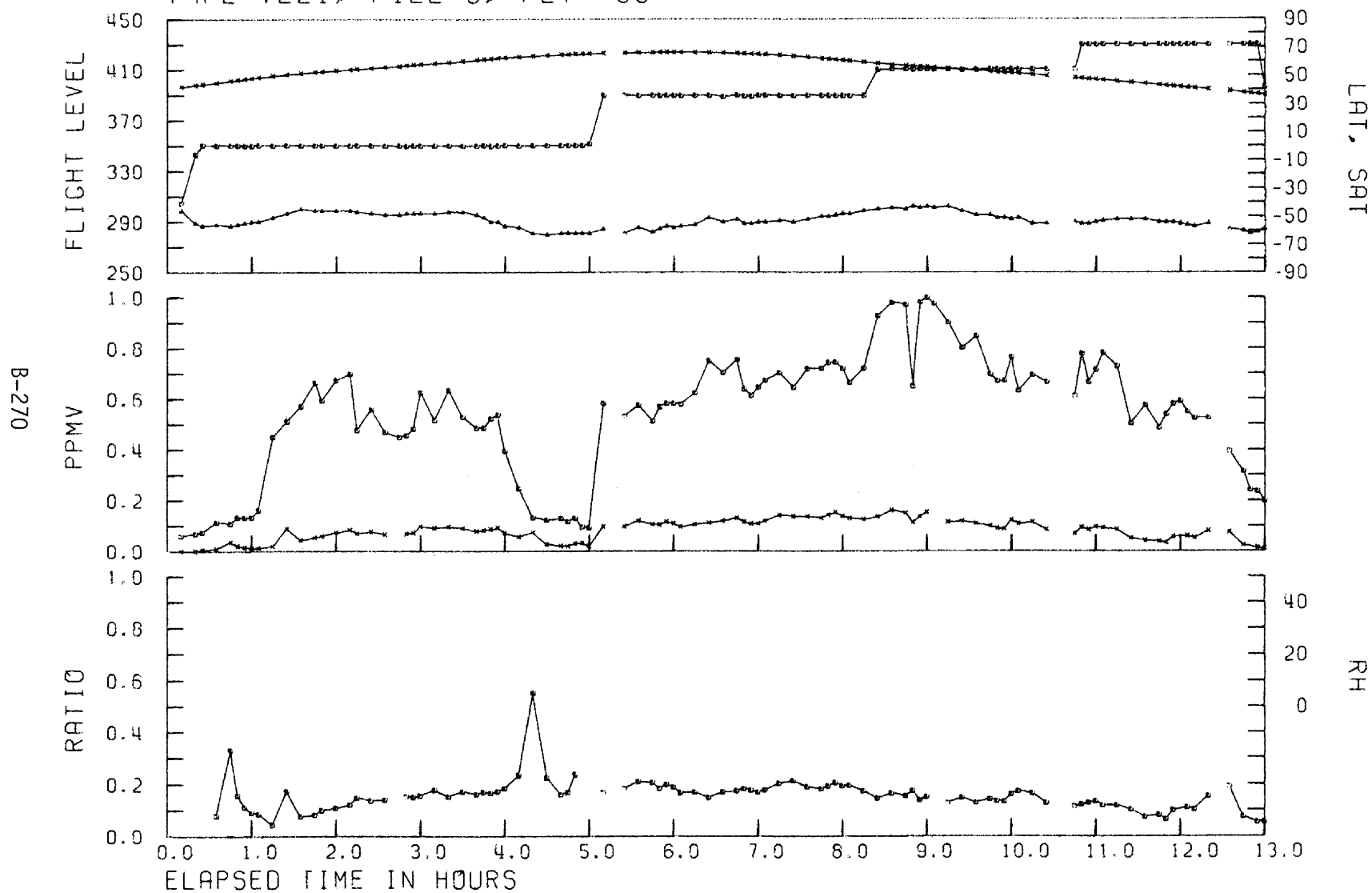


B-268

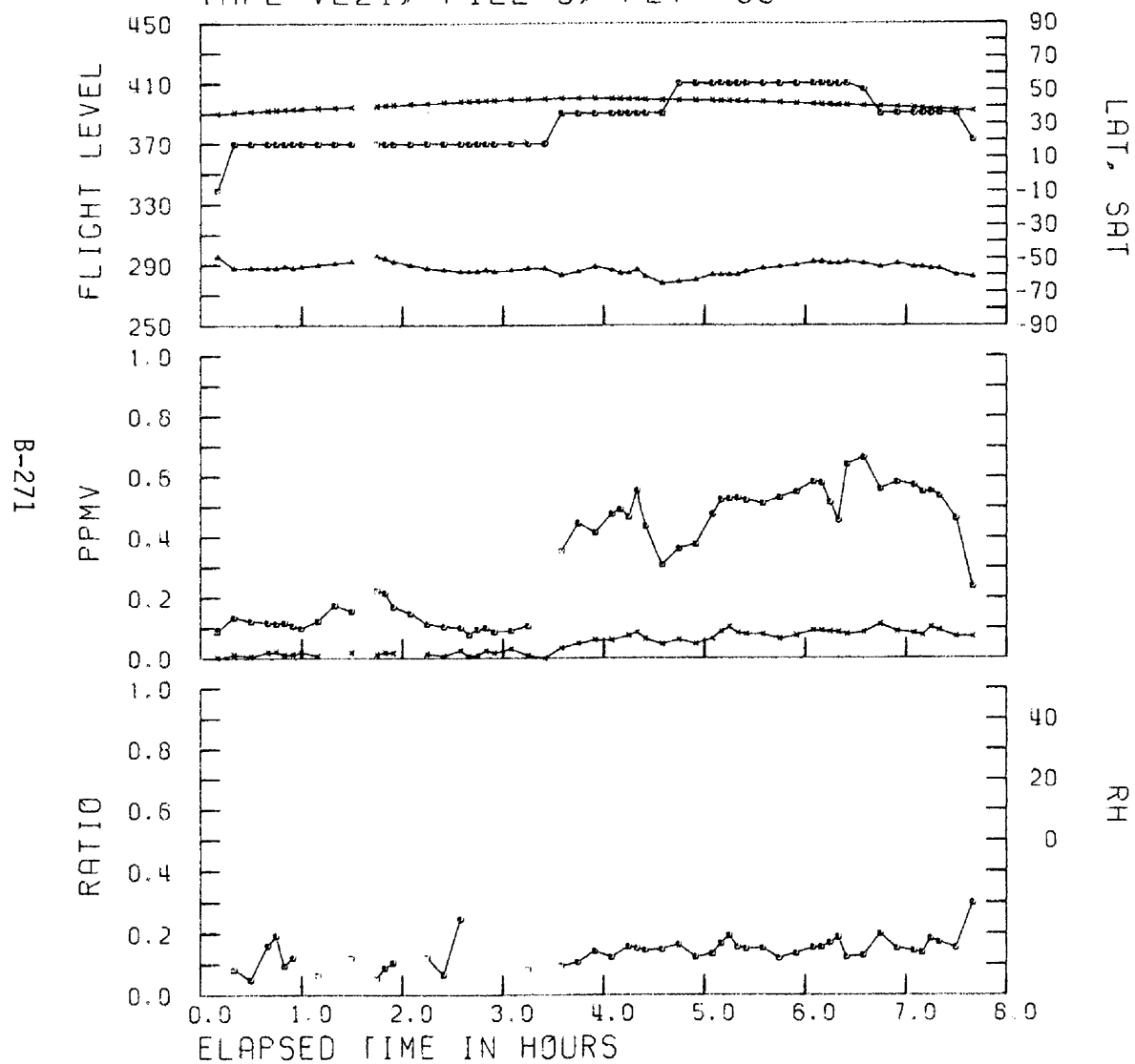
NRT TO JFK DEPARTURE 26 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 54



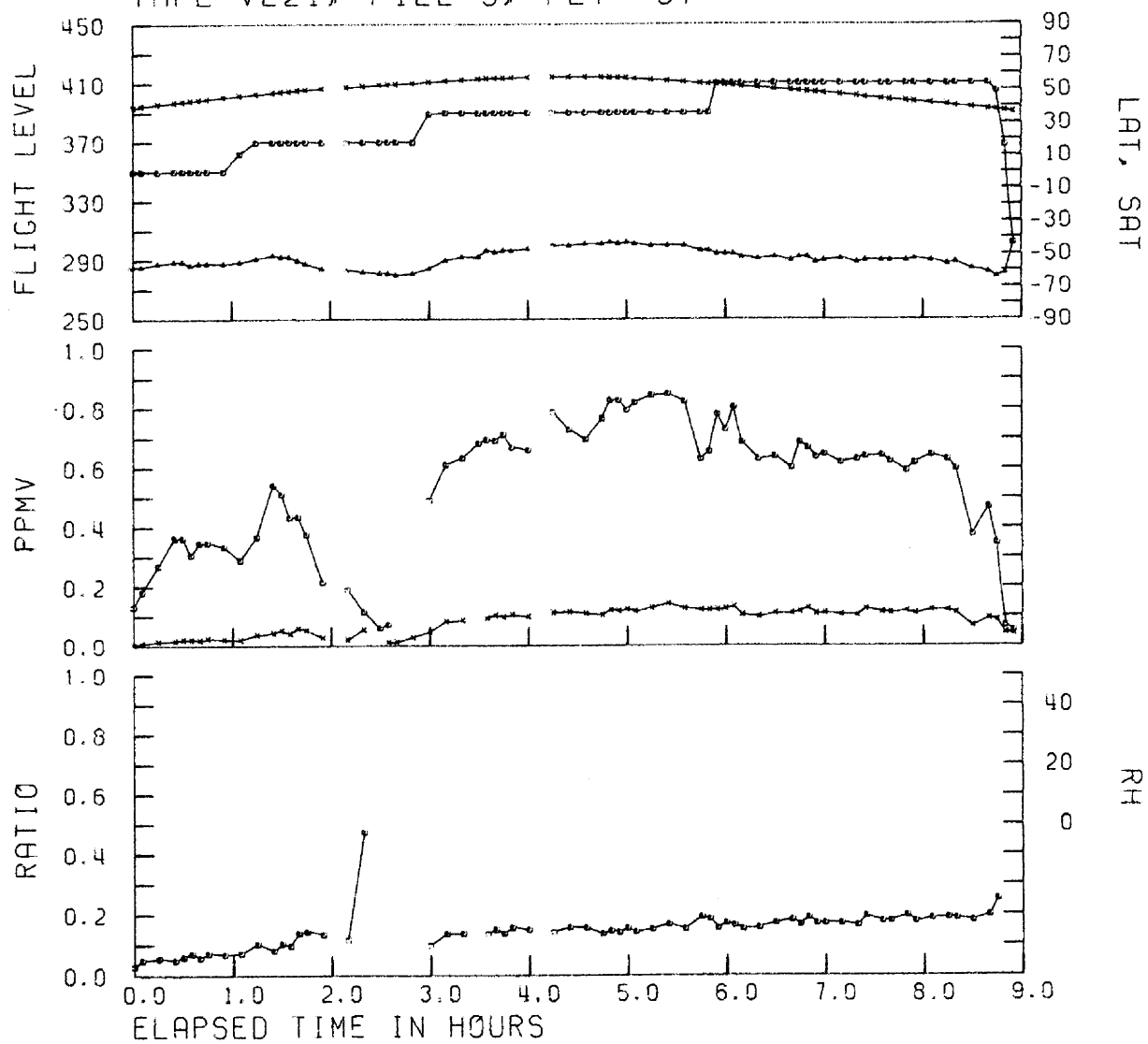
JFK TO NRT DEPARTURE 27 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 55



NRT TO SFO DEPARTURE 28 APR 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 56



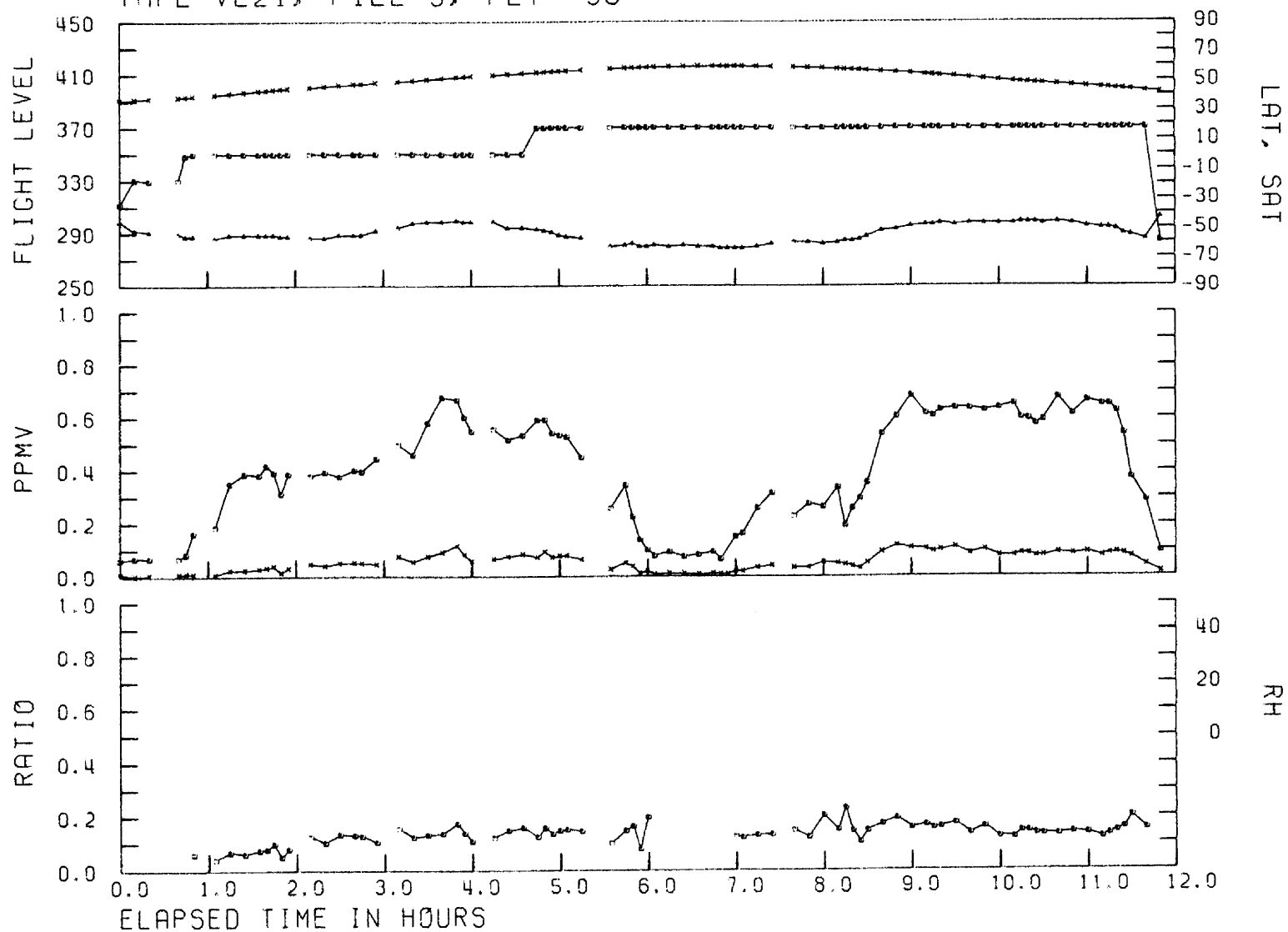
SFO TO NRT DEPARTURE 29 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 57



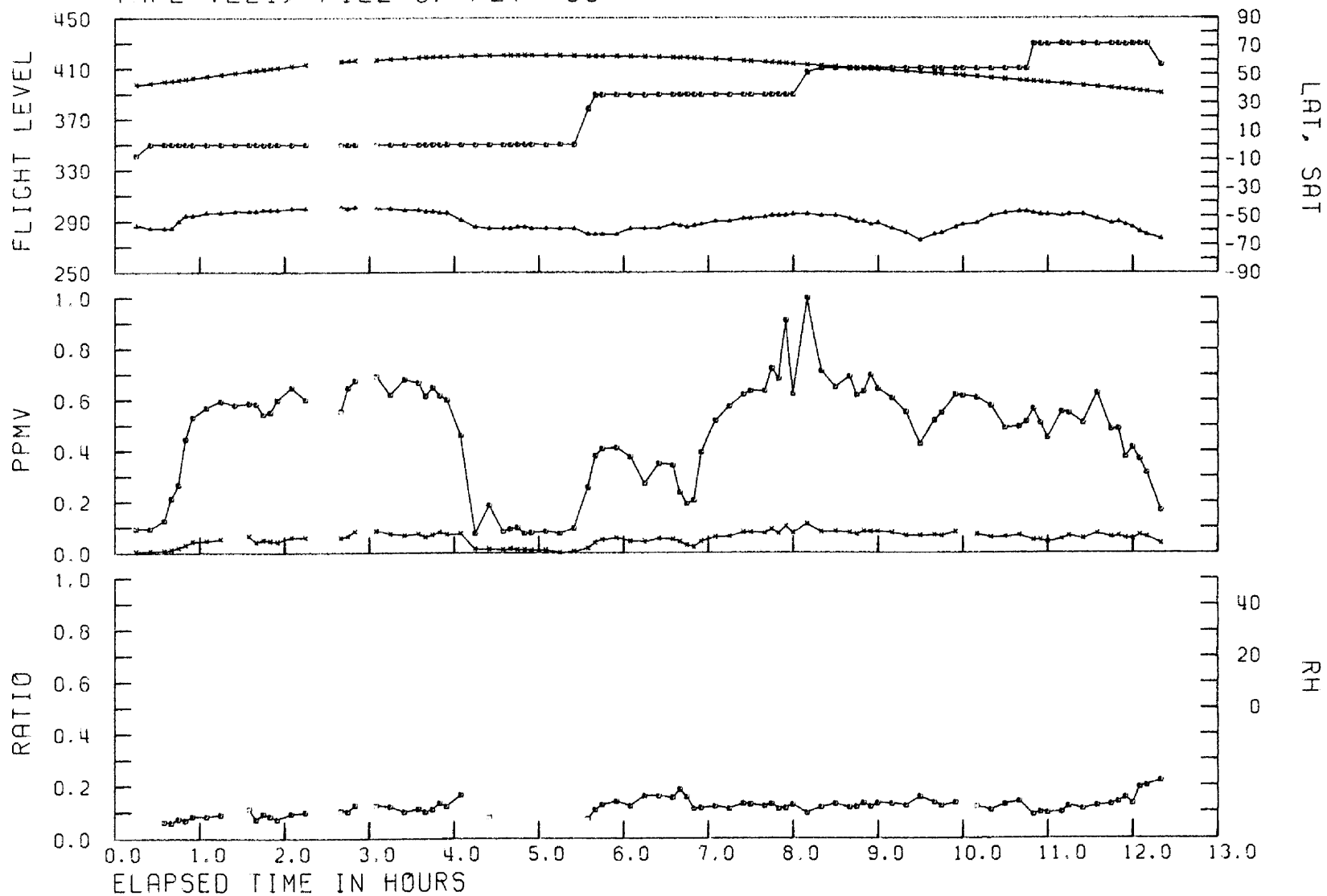
B-272

NRT TO JFK DEPARTURE 29 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 58

B-273

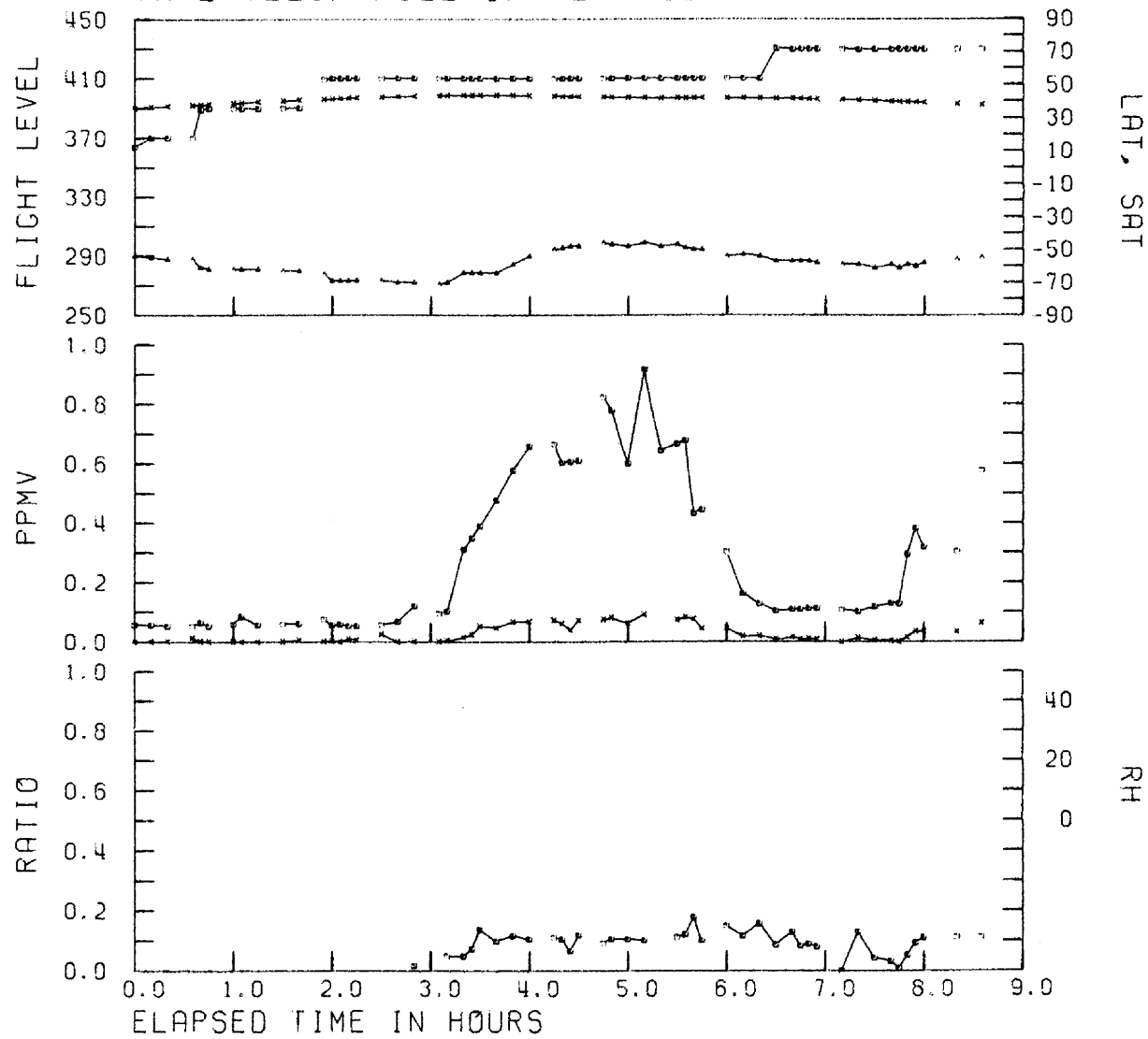


JFK TO NRT DEPARTURE 30 APR 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 59



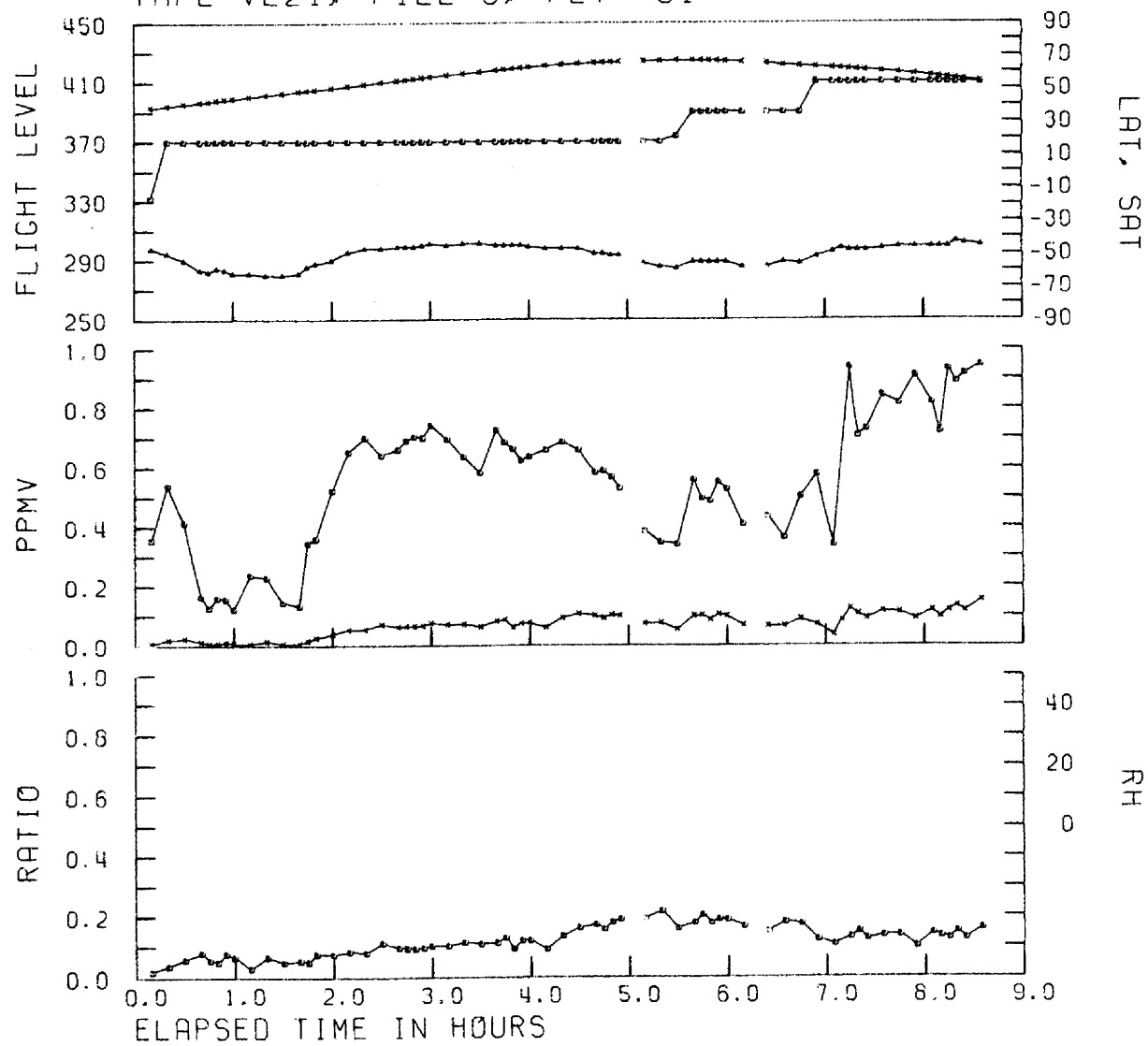
B-274

NRT TO SFO DEPARTURE 1 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 60



B-275

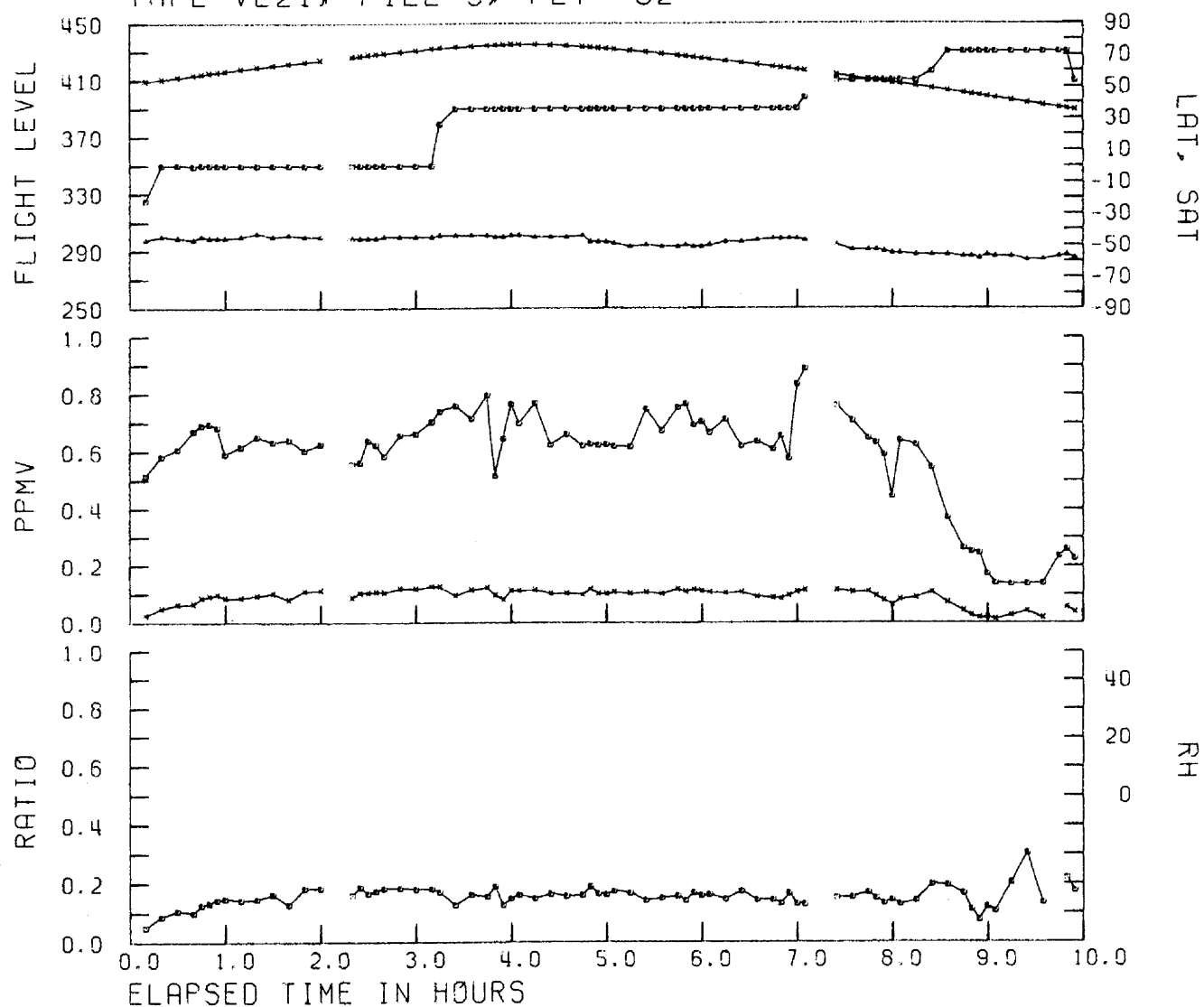
SFO TO LHR DEPARTURE 1 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 61



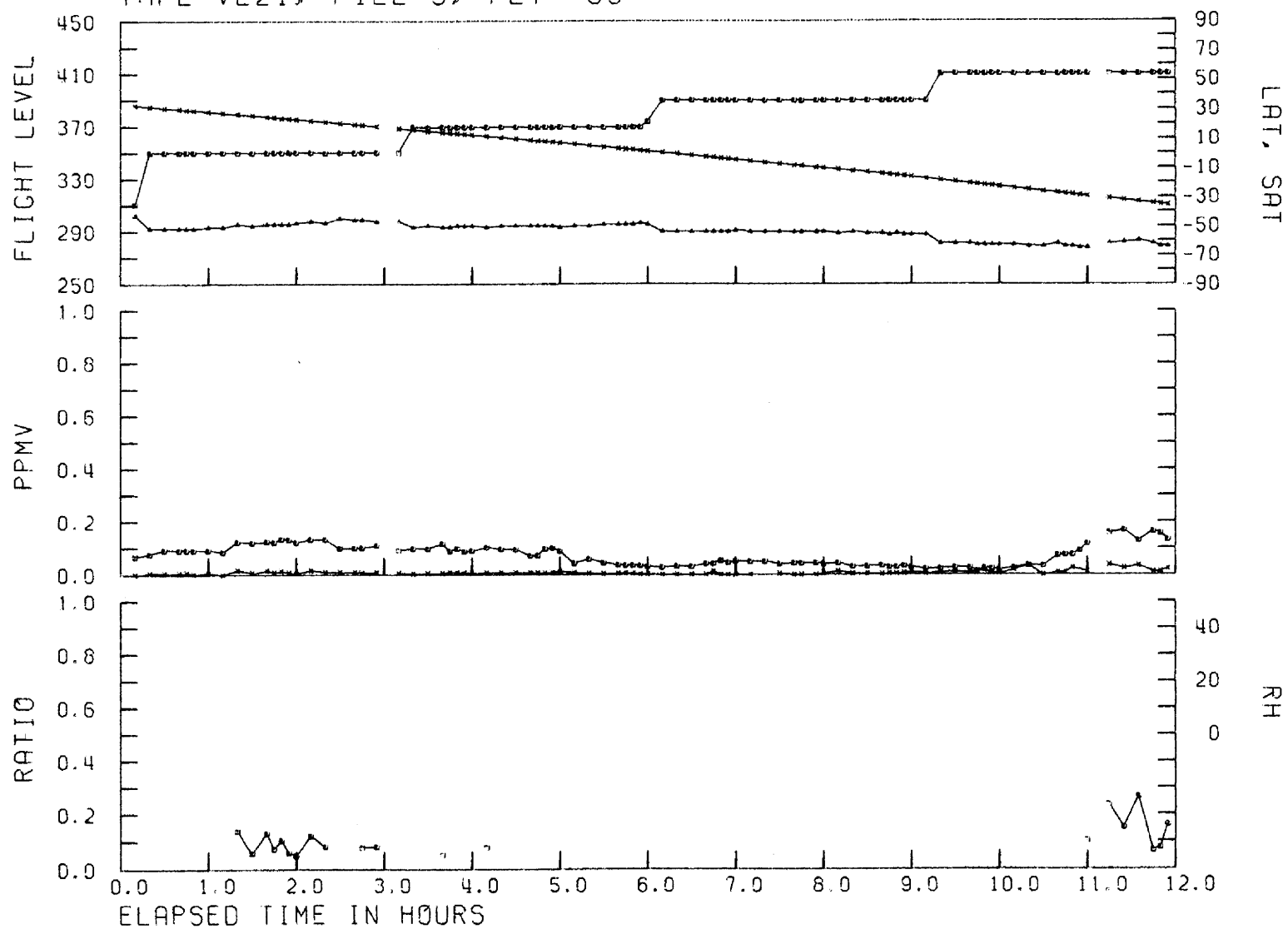
B-276

LHR TO LAX DEPARTURE 2 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 62

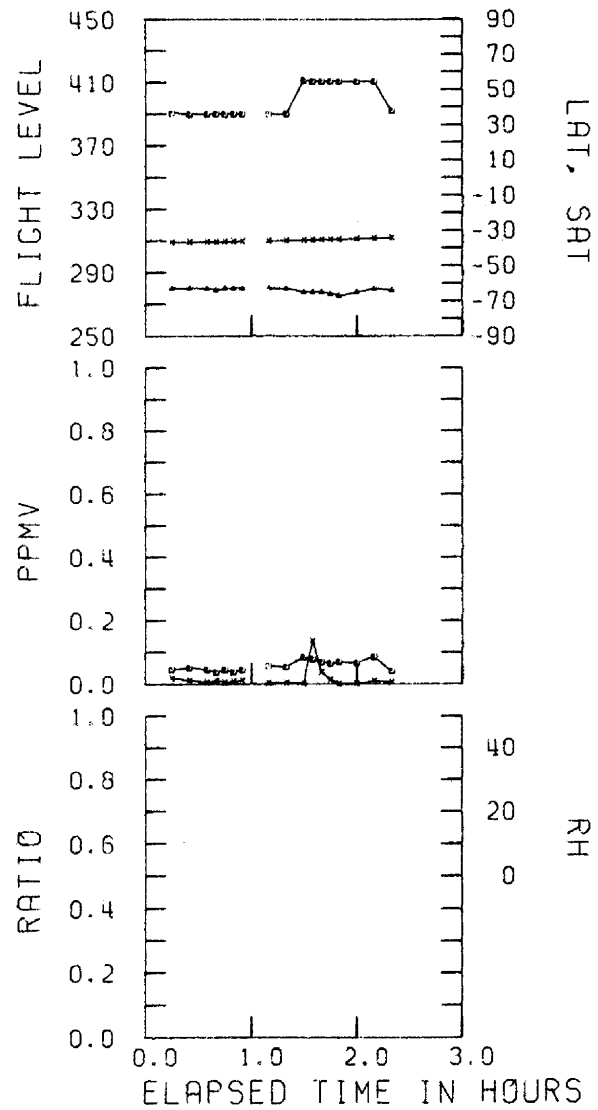
B-277



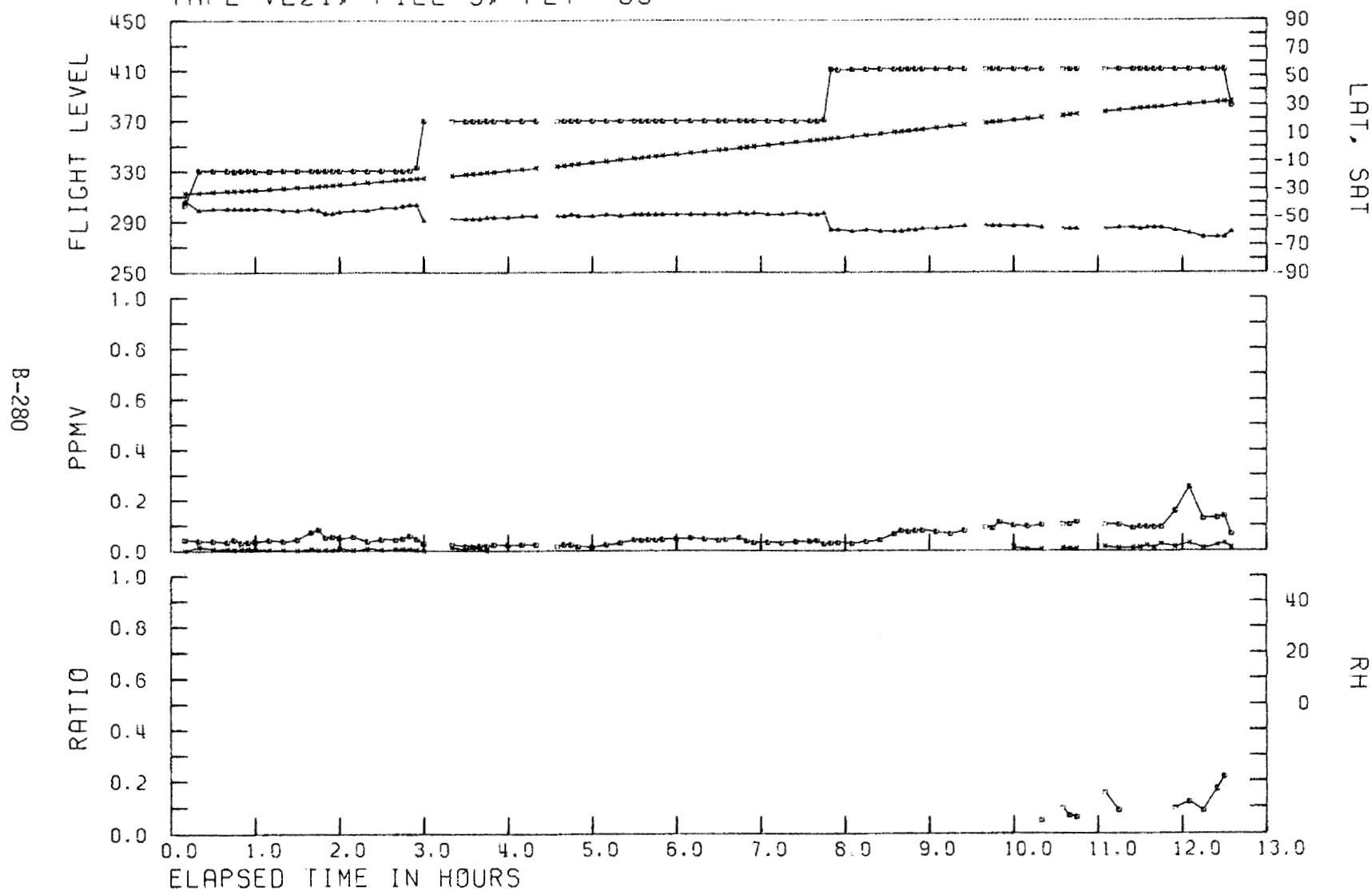
LAX TO AKL DEPARTURE 3 MAY 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 63



AKL TO SYD DEPARTURE 3 MAY 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 64

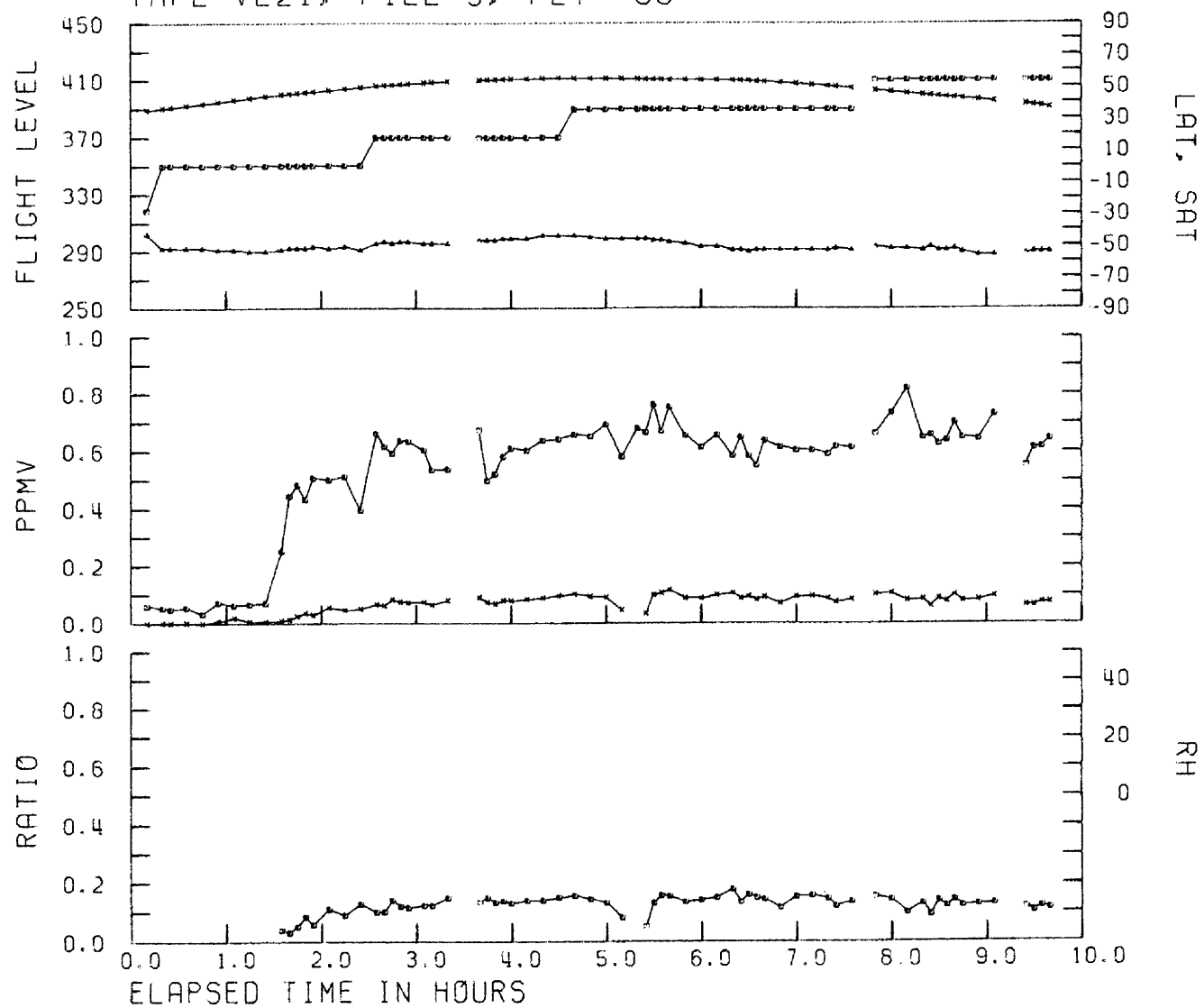


SYD TO LAX DEPARTURE 4 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 65



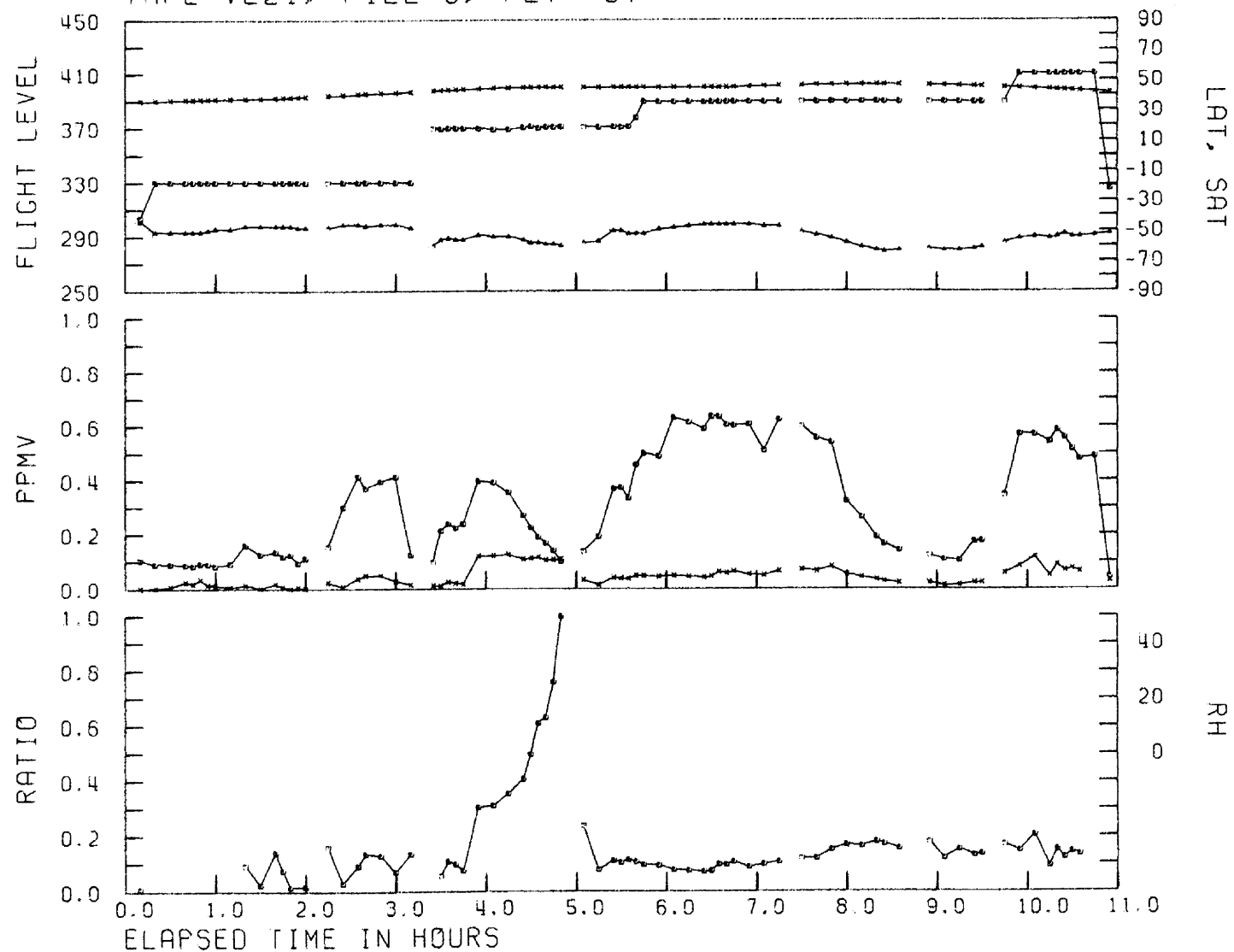
LAX TO NRT DEPARTURE 4 MAY 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 66

B-281

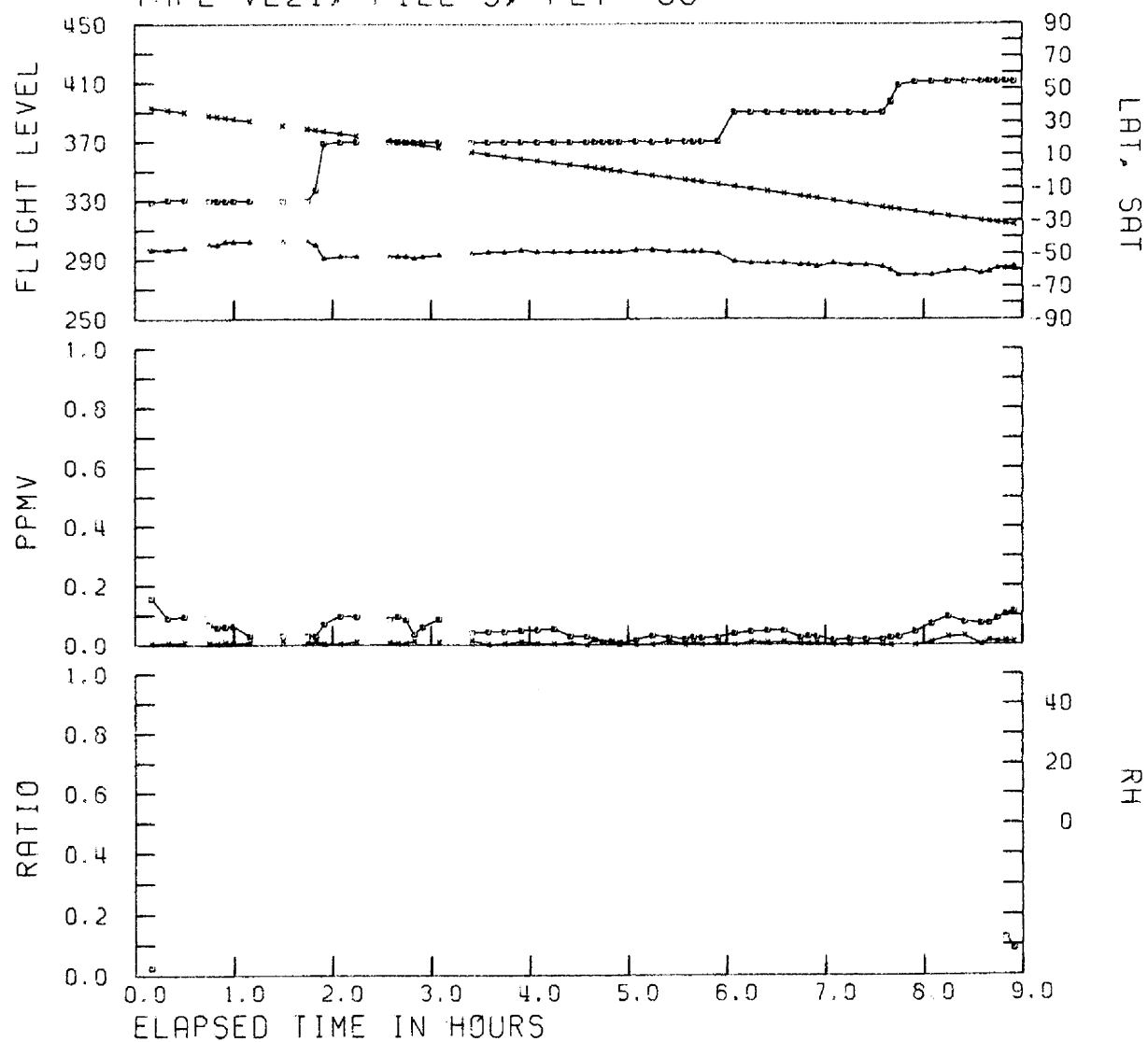


NRT TO JFK DEPARTURE 5 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 67

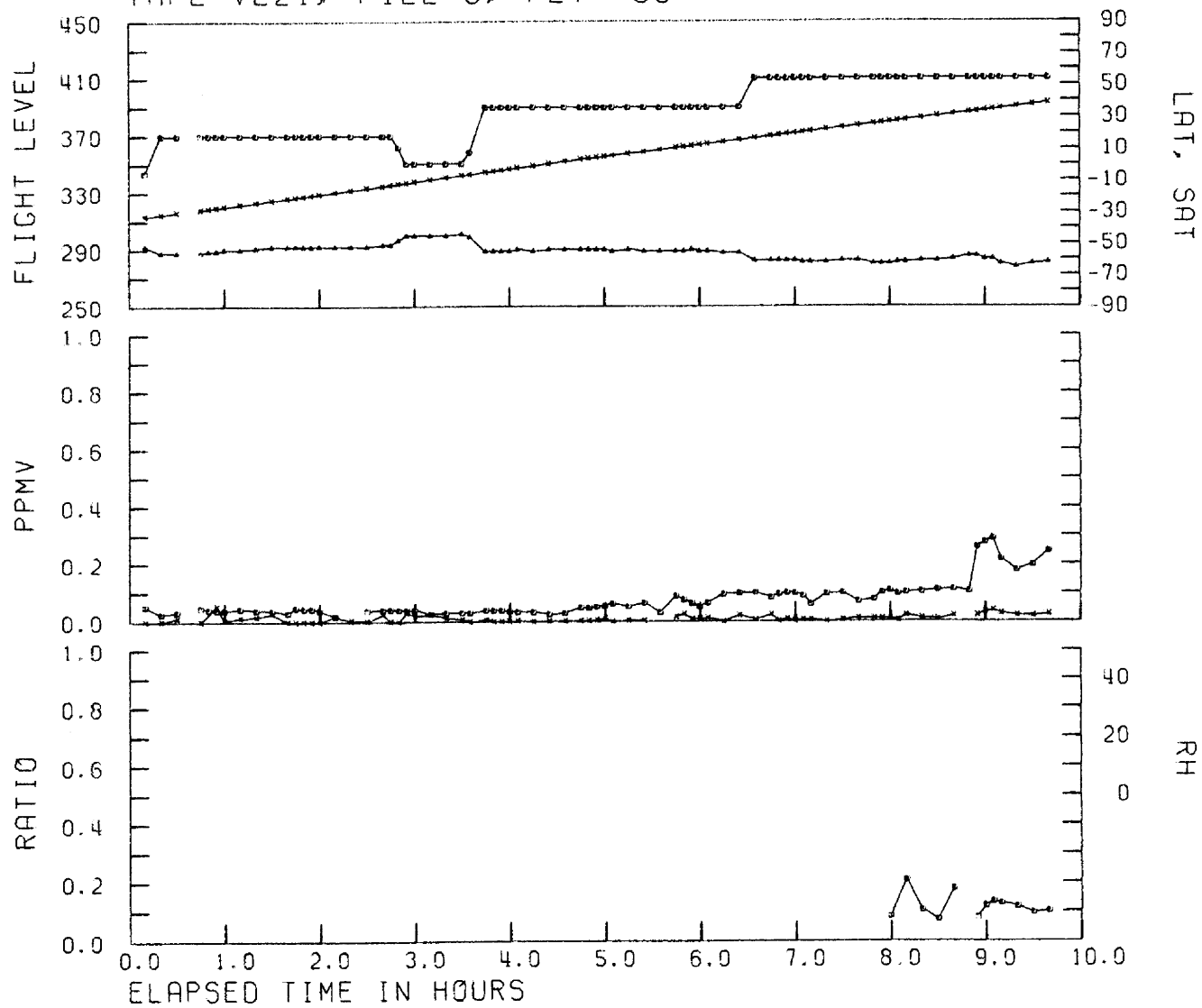
B-282



JFK TO EZE DEPARTURE 6 MAY 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 68

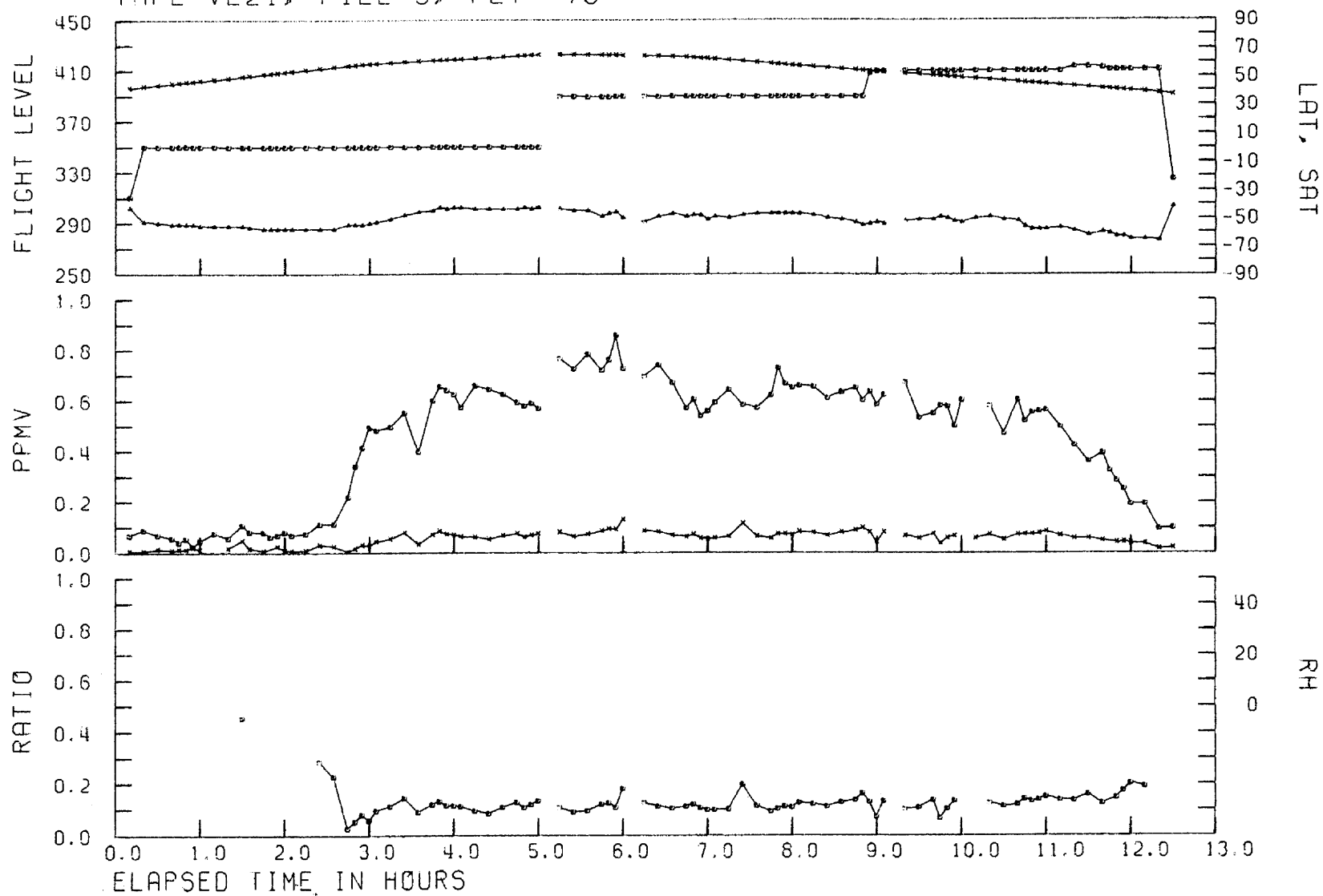


EZE TO JFK DEPARTURE 6 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 69



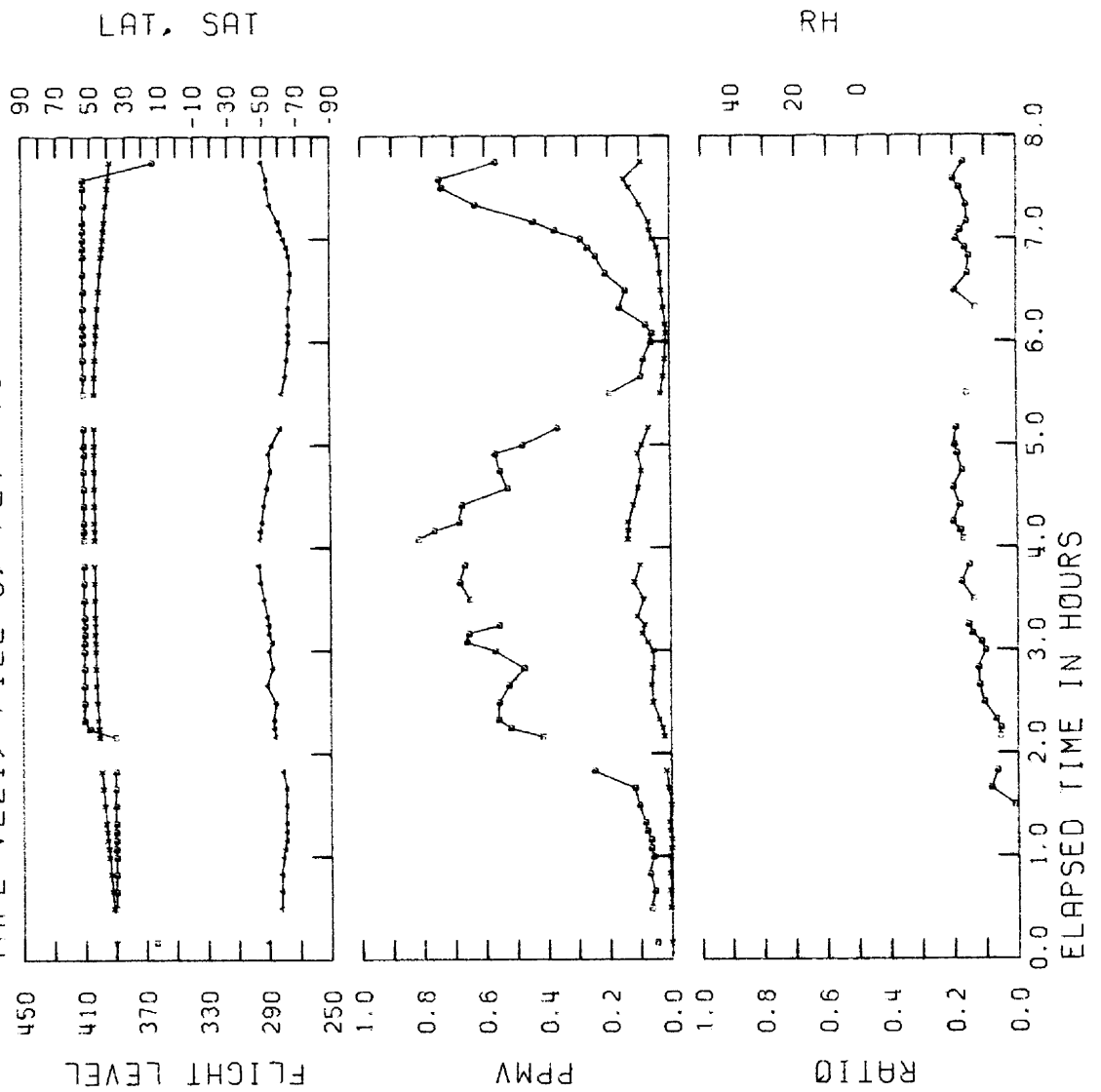
B-284

JFK TO NRT DEPARTURE 7 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 70

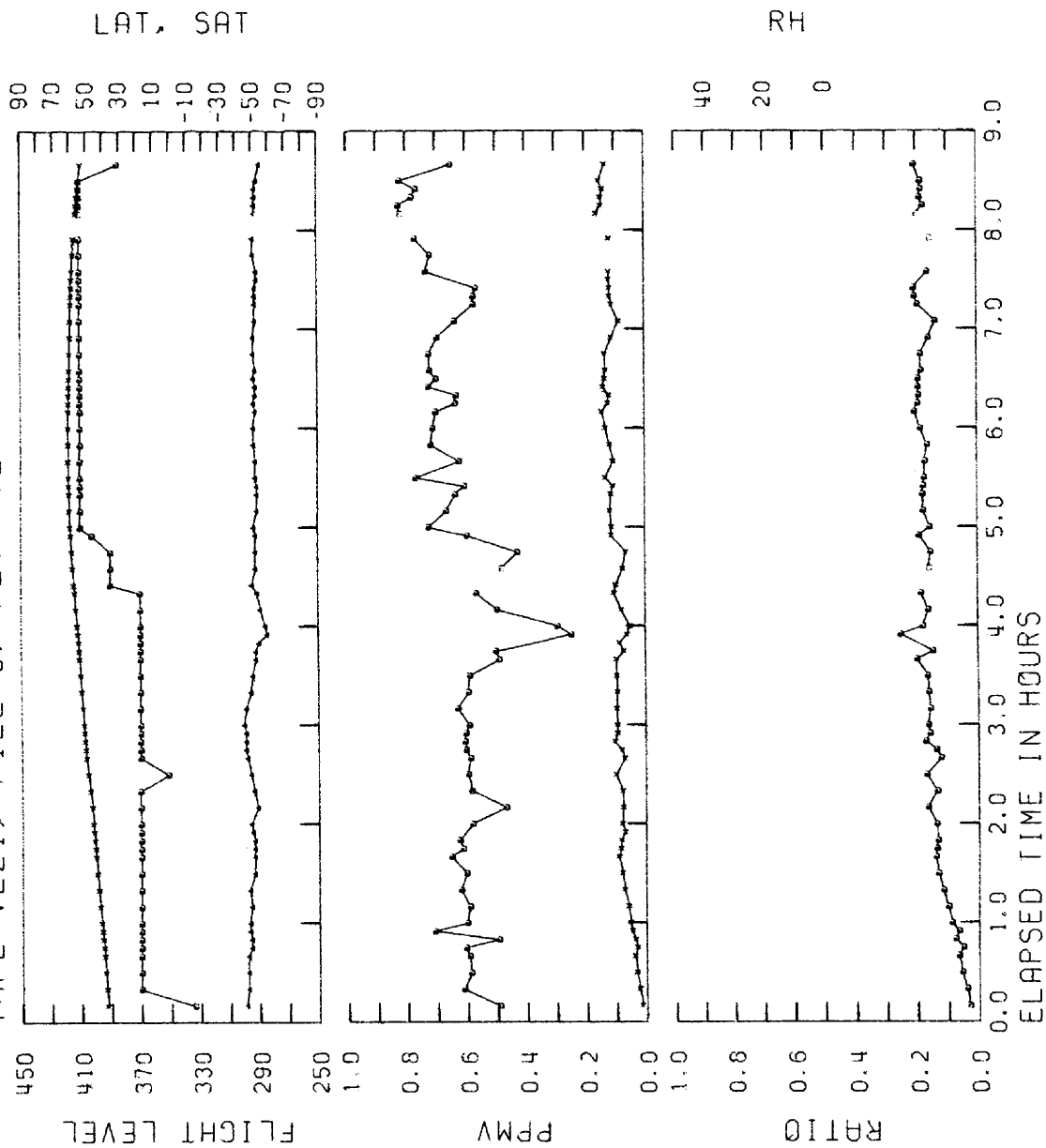


B-285

NRT TO SFO DEPARTURE 8 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 71

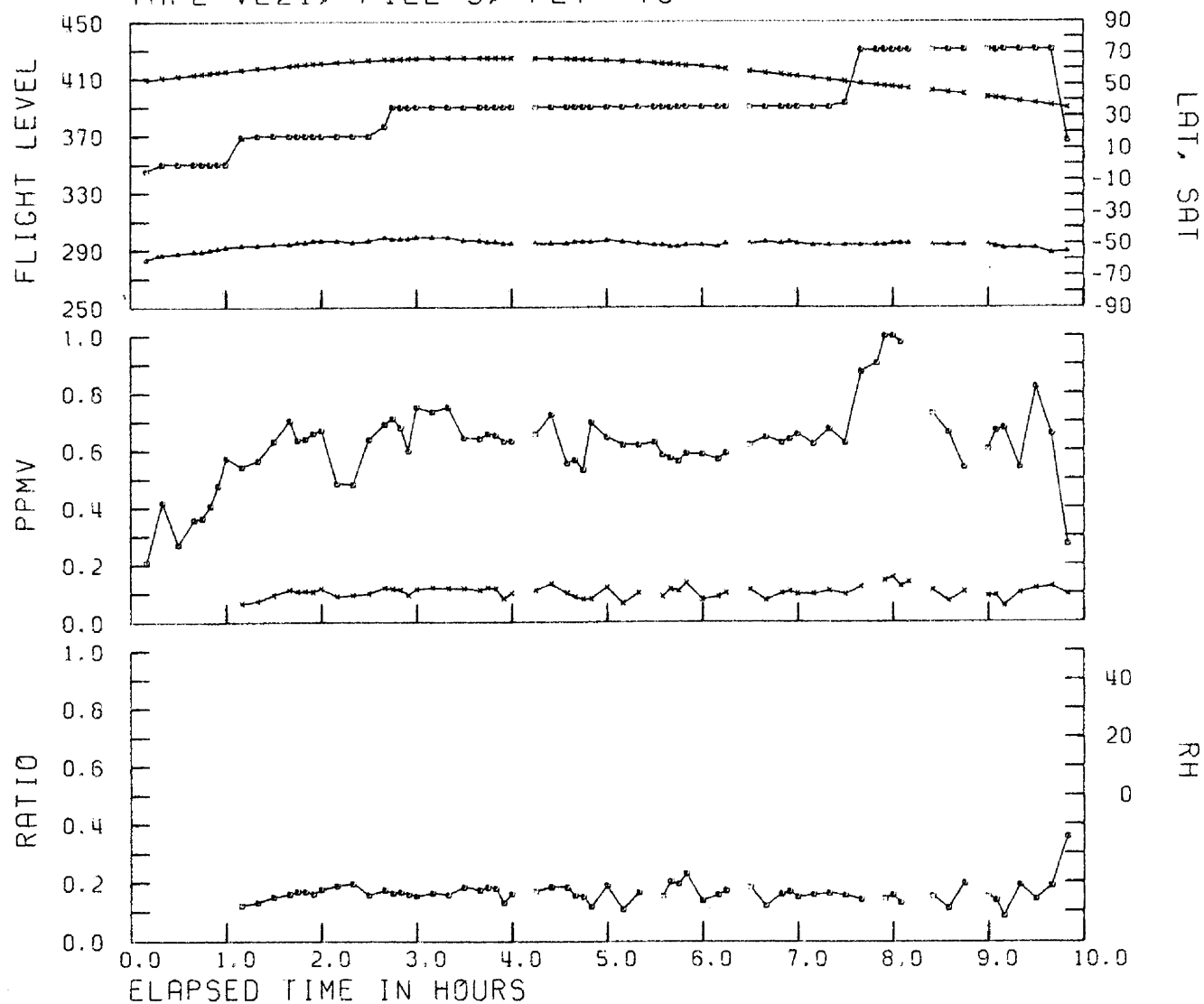


SFO TO LHR DEPARTURE 8 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 72



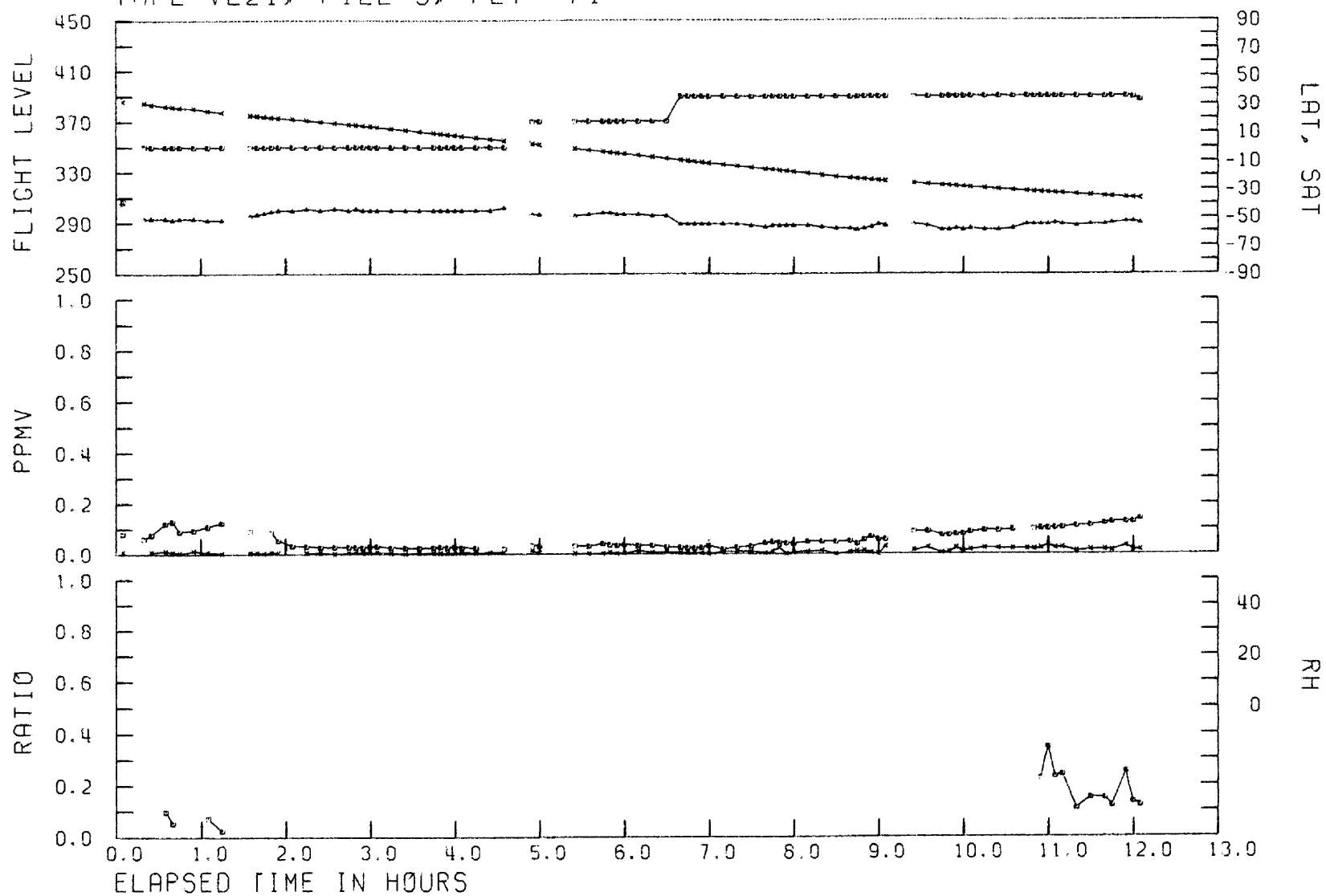
LHR TO LAX DEPARTURE 9 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 73

B-288

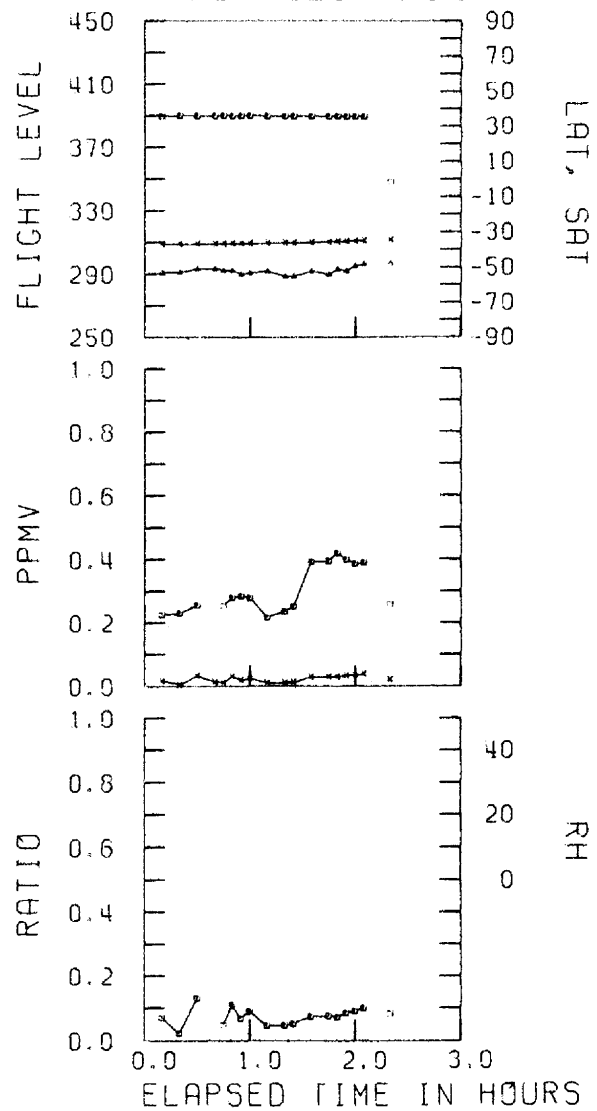


LAX TO AKL DEPARTURE 10 MAY 79 PANAM -N533PA
 TAPE VL21, FILE 3, FLT 74

B-289



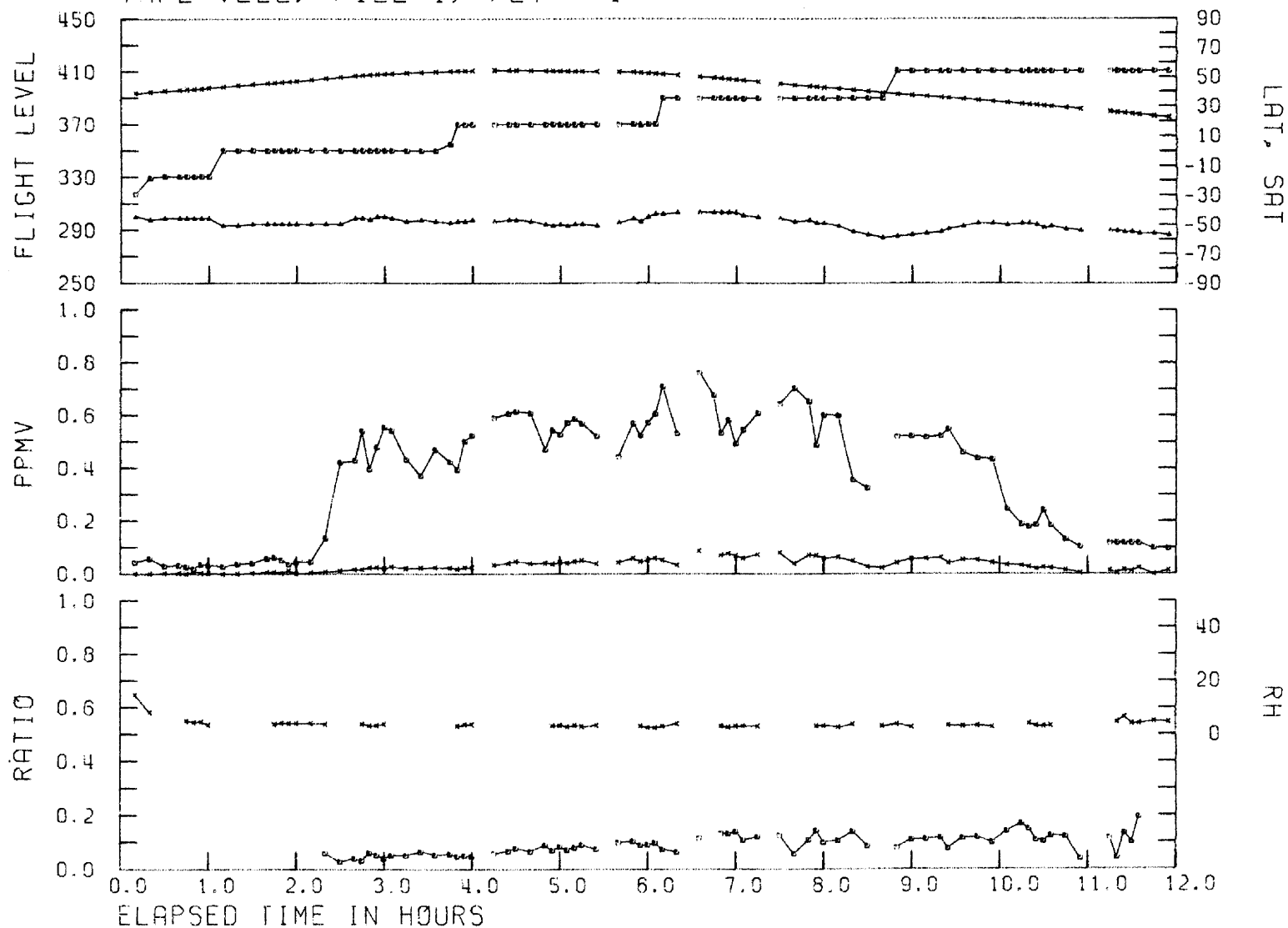
AKL TO SYD DEPARTURE 10 MAY 79 PANAM -N533PA
TAPE VL21, FILE 3, FLT 75



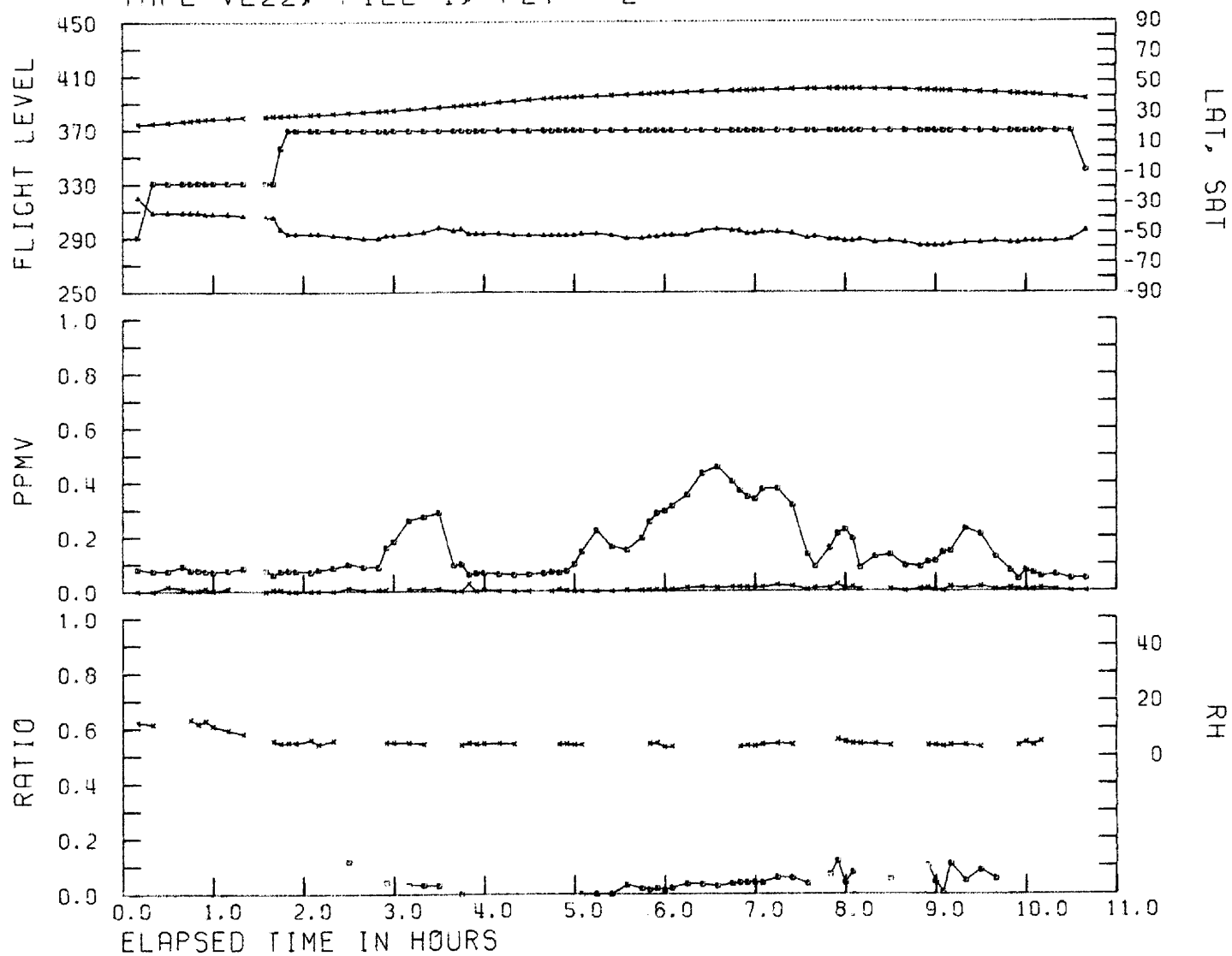
B-290

SFO TO HKG DEPARTURE 31 MAY 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 1

B-291

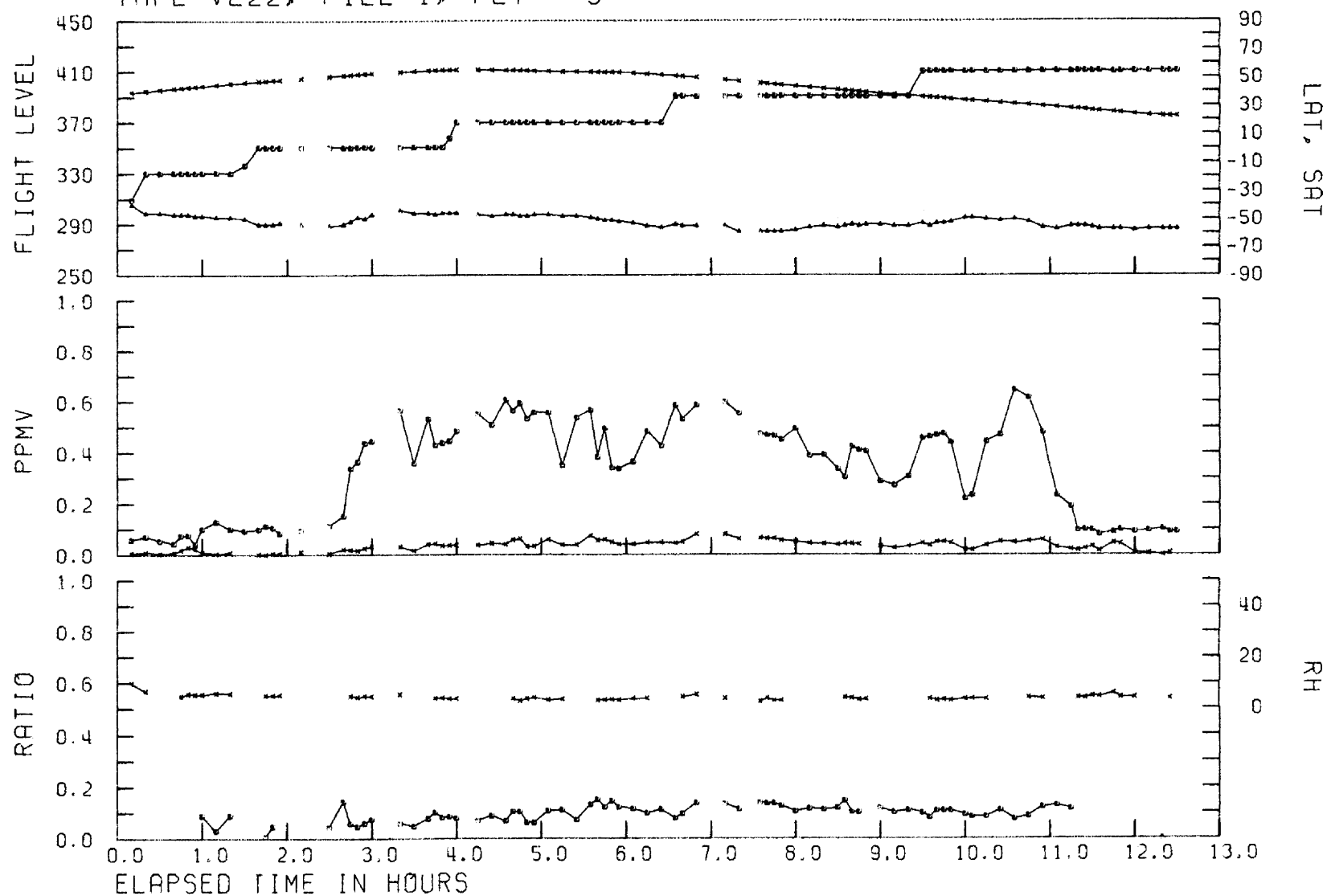


HKG TO SFO DEPARTURE 2 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 2

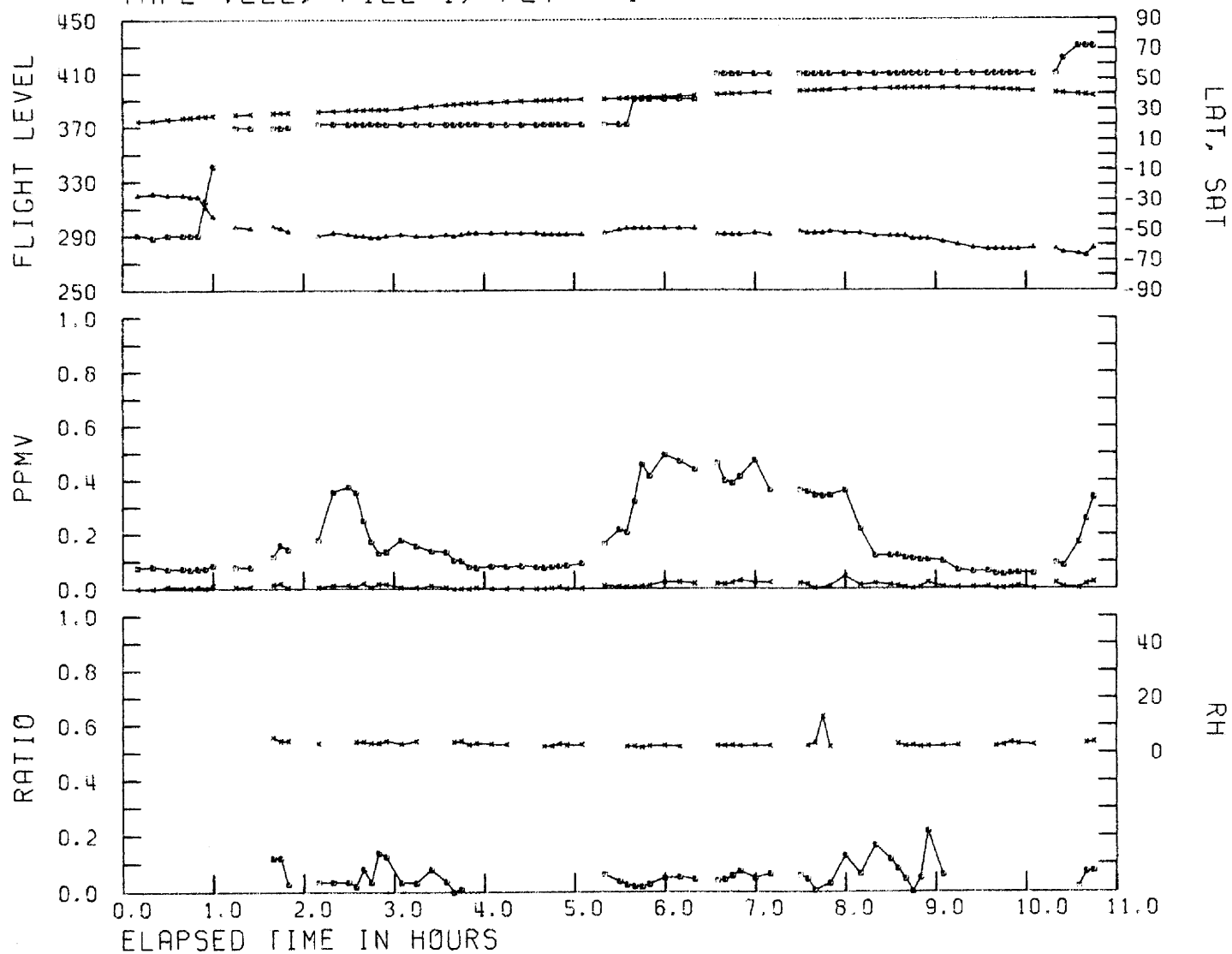


SFO TO HKG DEPARTURE 2 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 3

B-293



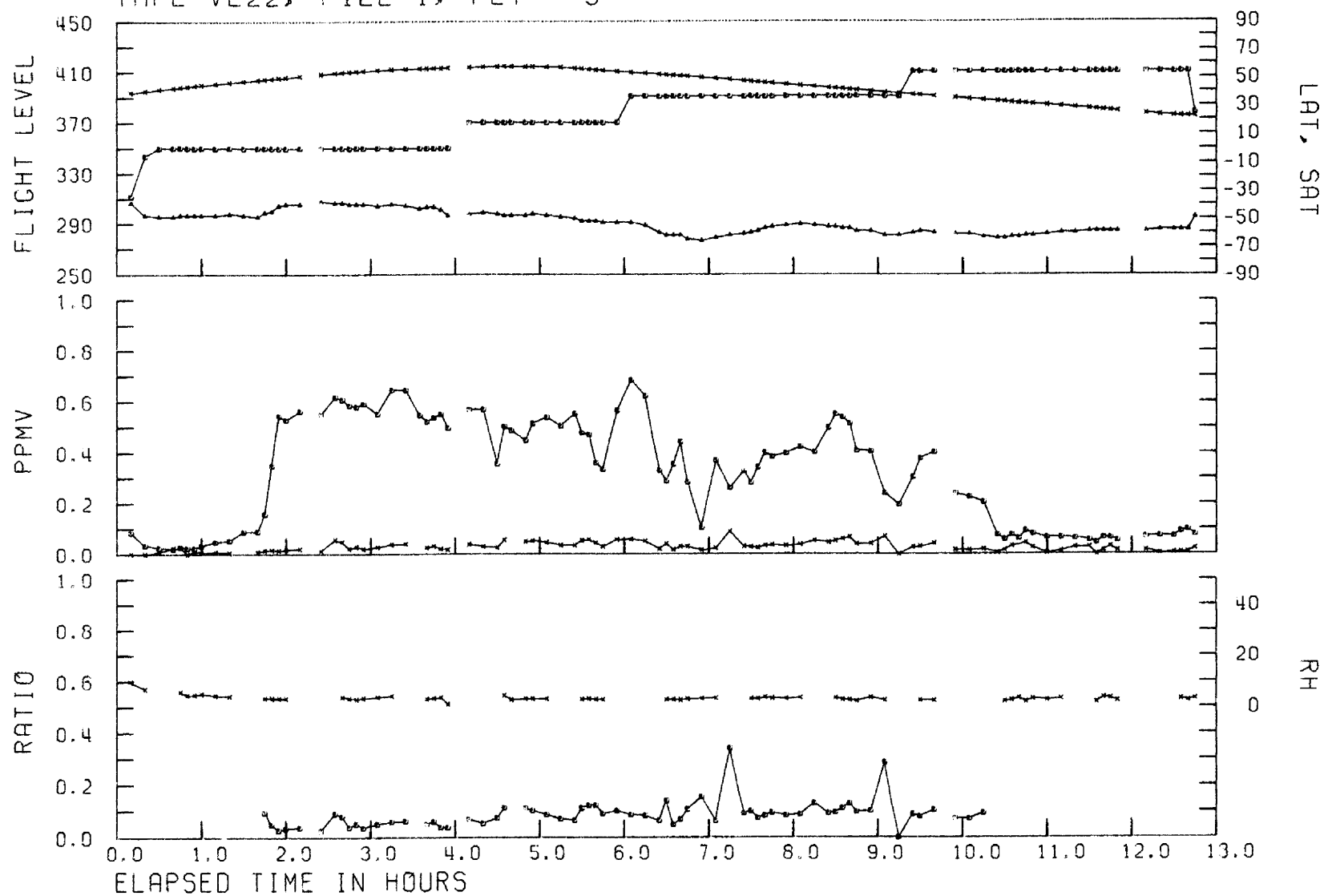
HKG TO SFO DEPARTURE 4 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 4



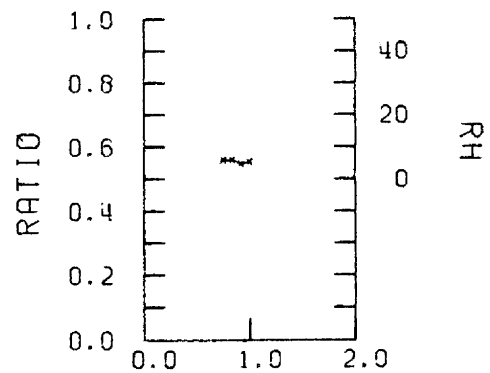
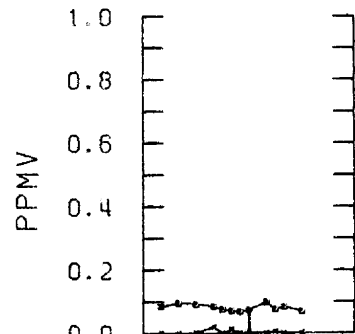
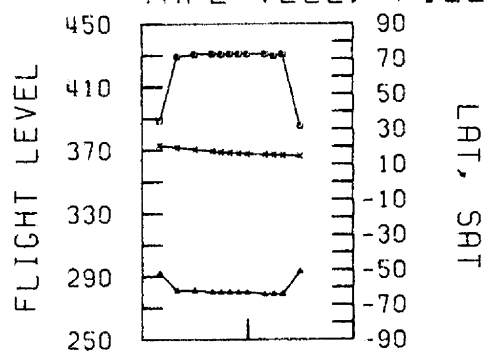
B-294

SFO TO HKG DEPARTURE 4 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 5

B-295



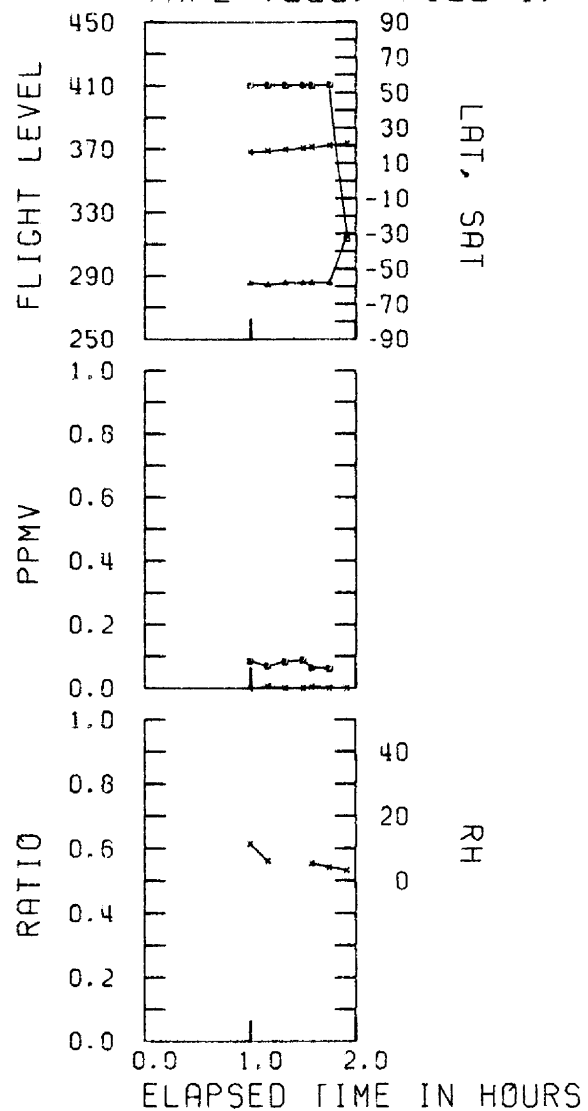
HKG TO BKK DEPARTURE 5 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 6



ELAPSED TIME IN HOURS

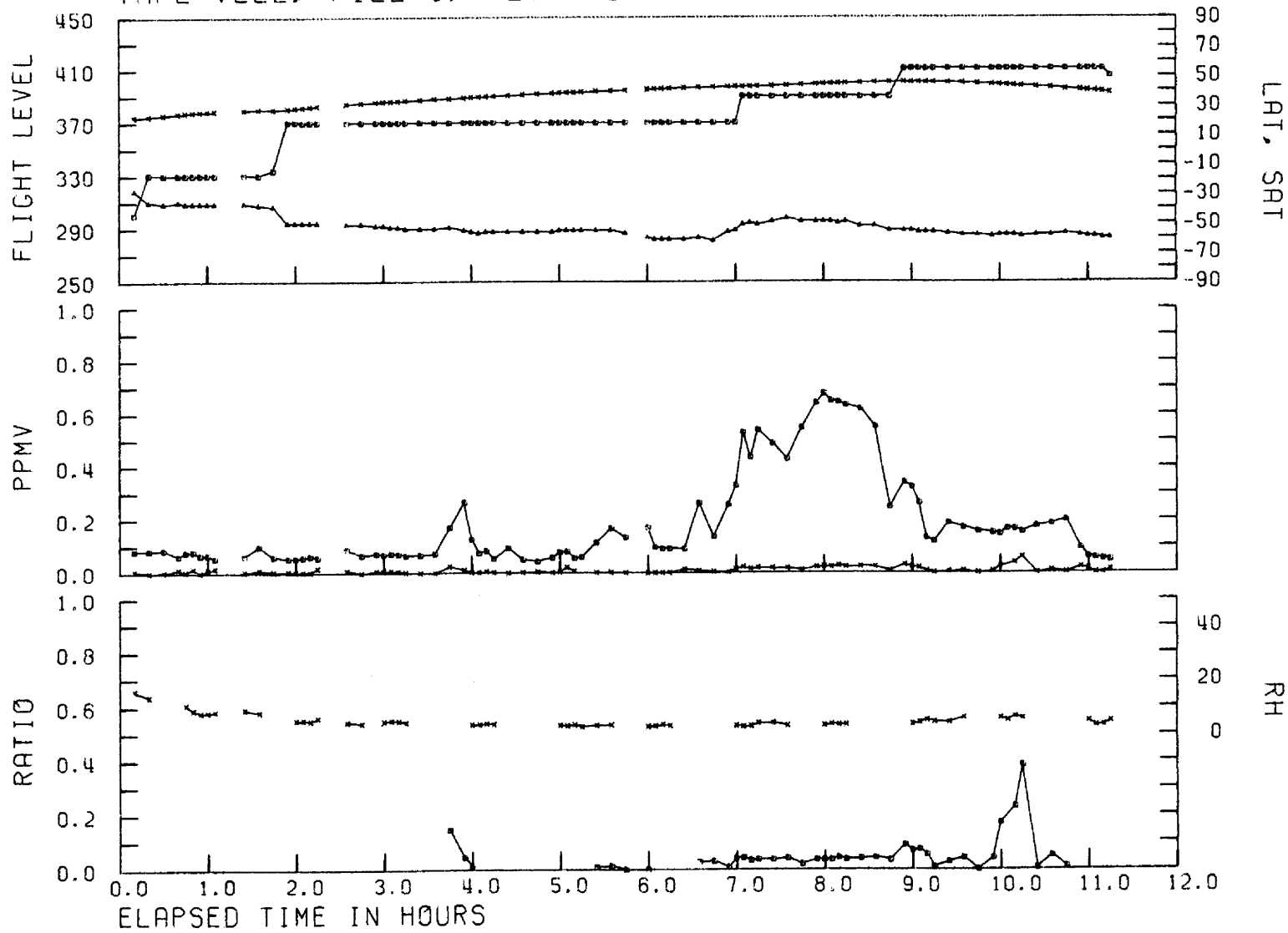
B-296

BKK TO HKG DEPARTURE 6 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 7

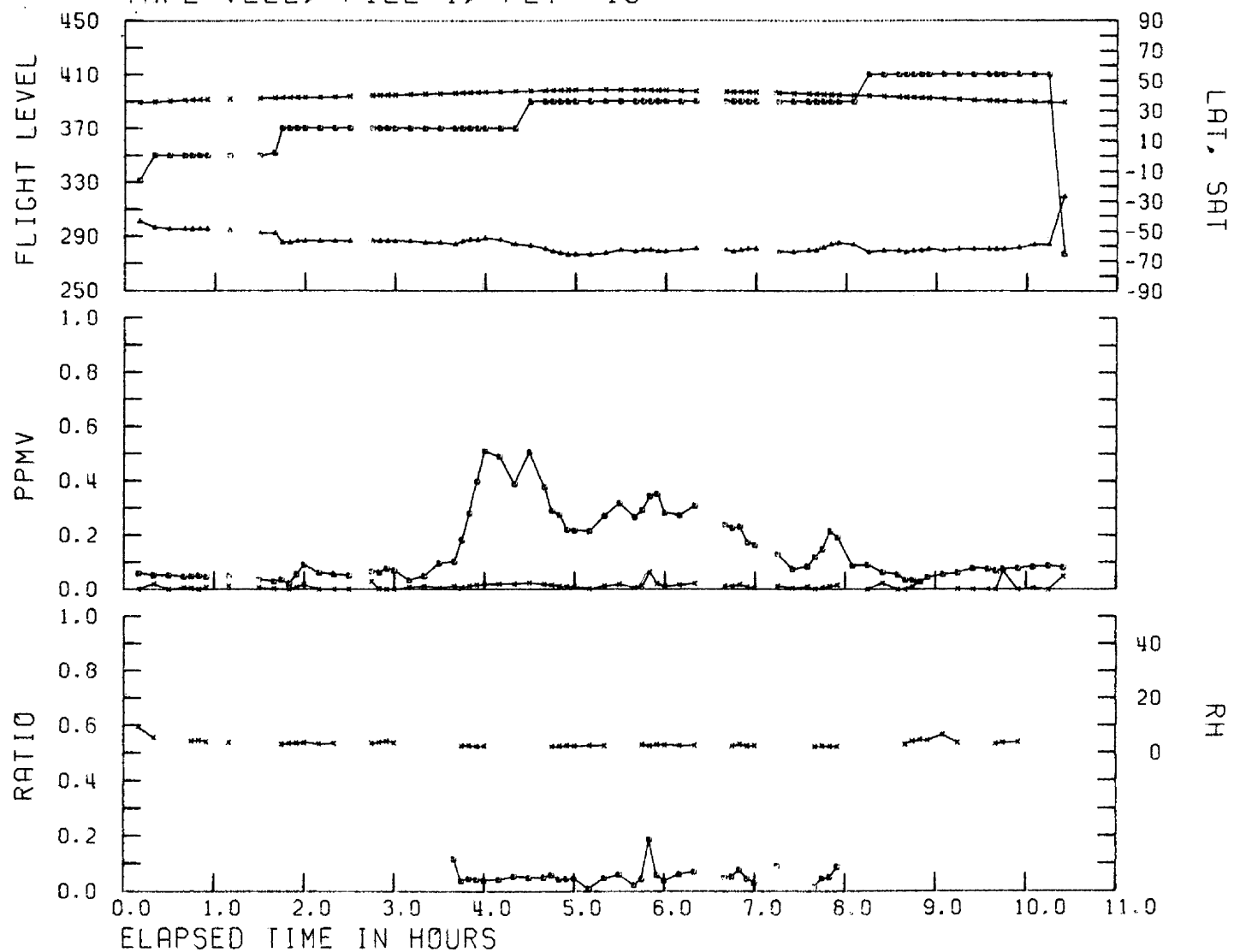


B-297

HKG TO SFO DEPARTURE 6 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 8

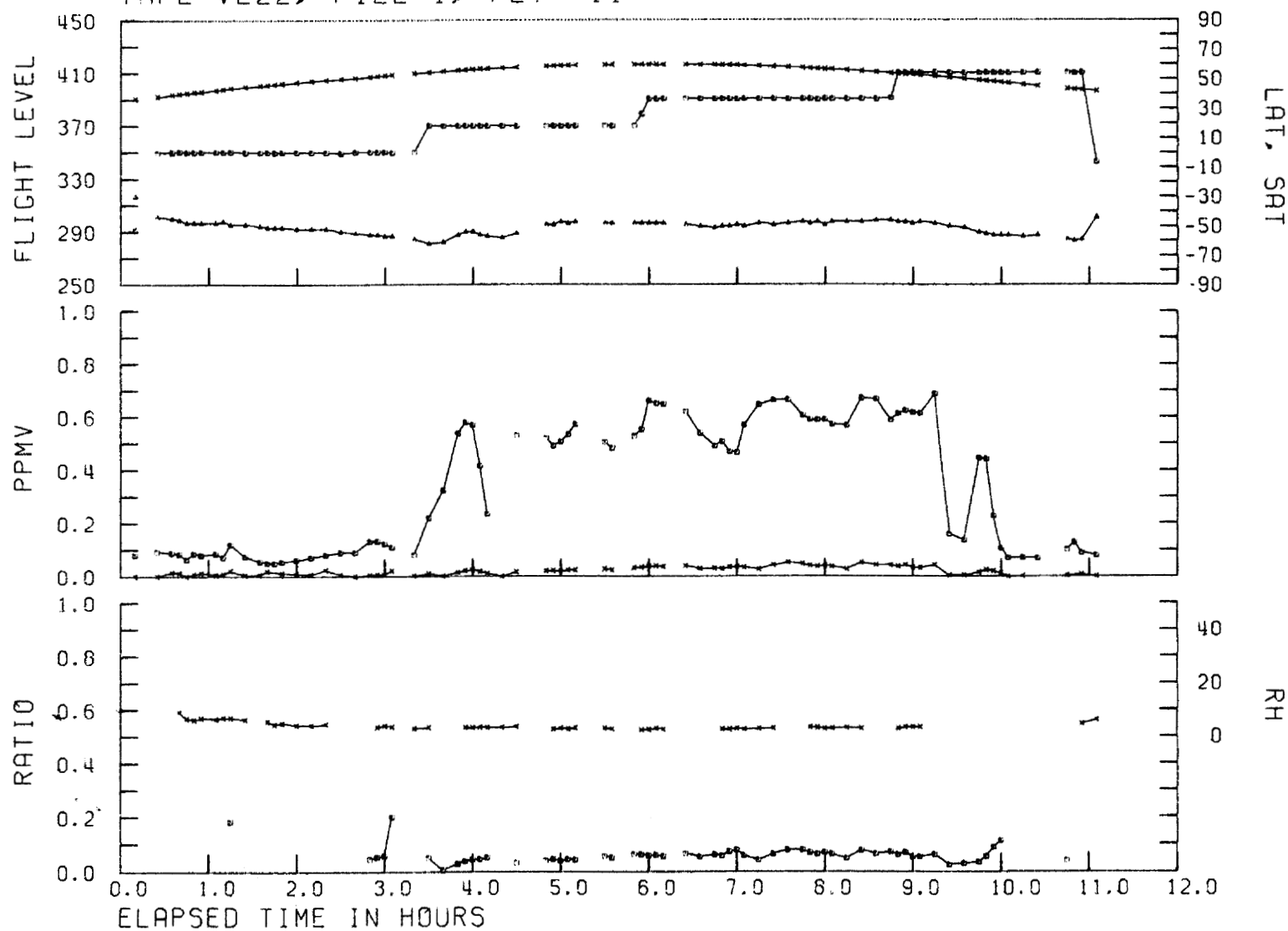


LAX TO NRT DEPARTURE 7 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 10

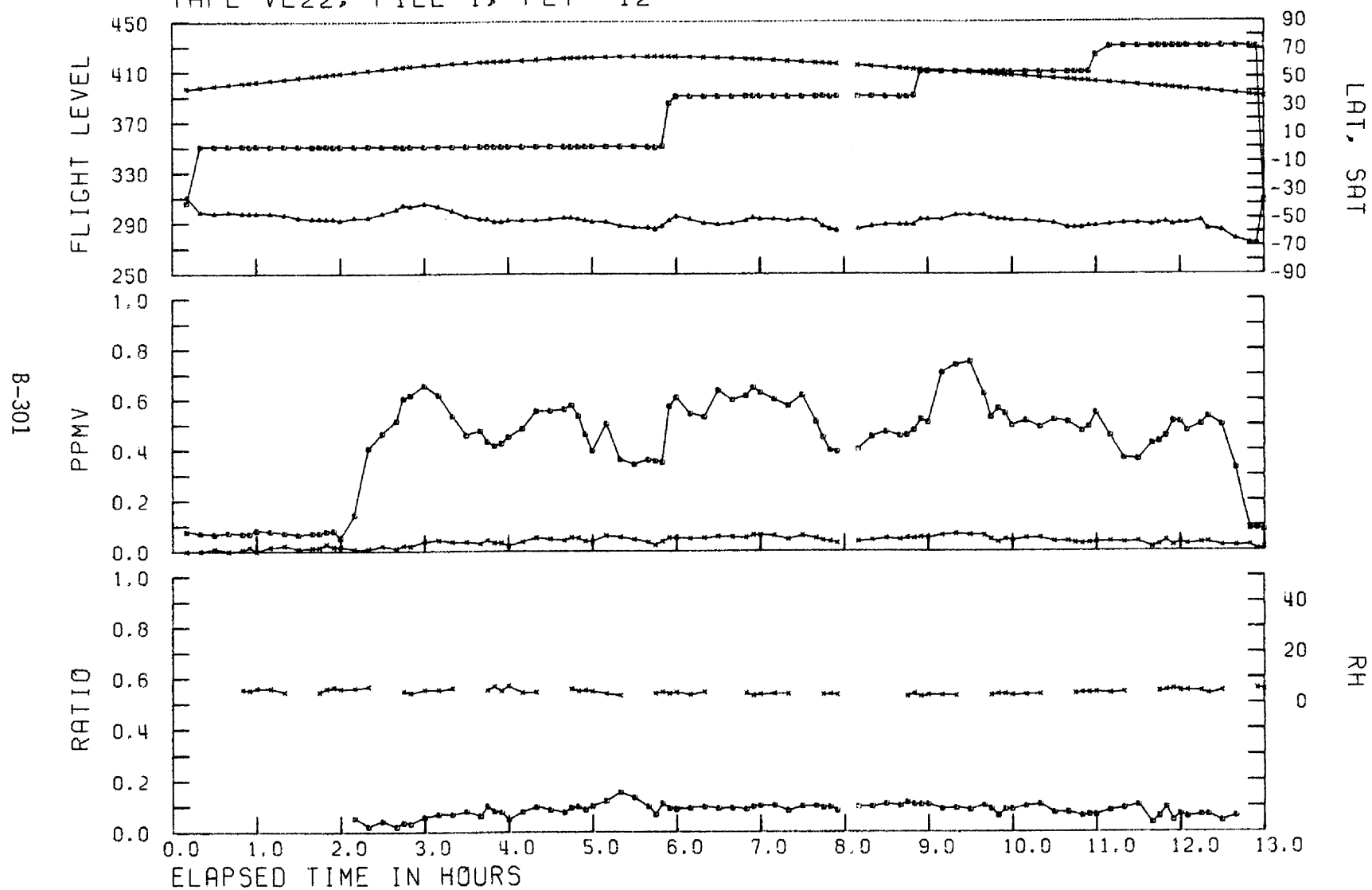


NRT TO JFK DEPARTURE 8 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 11

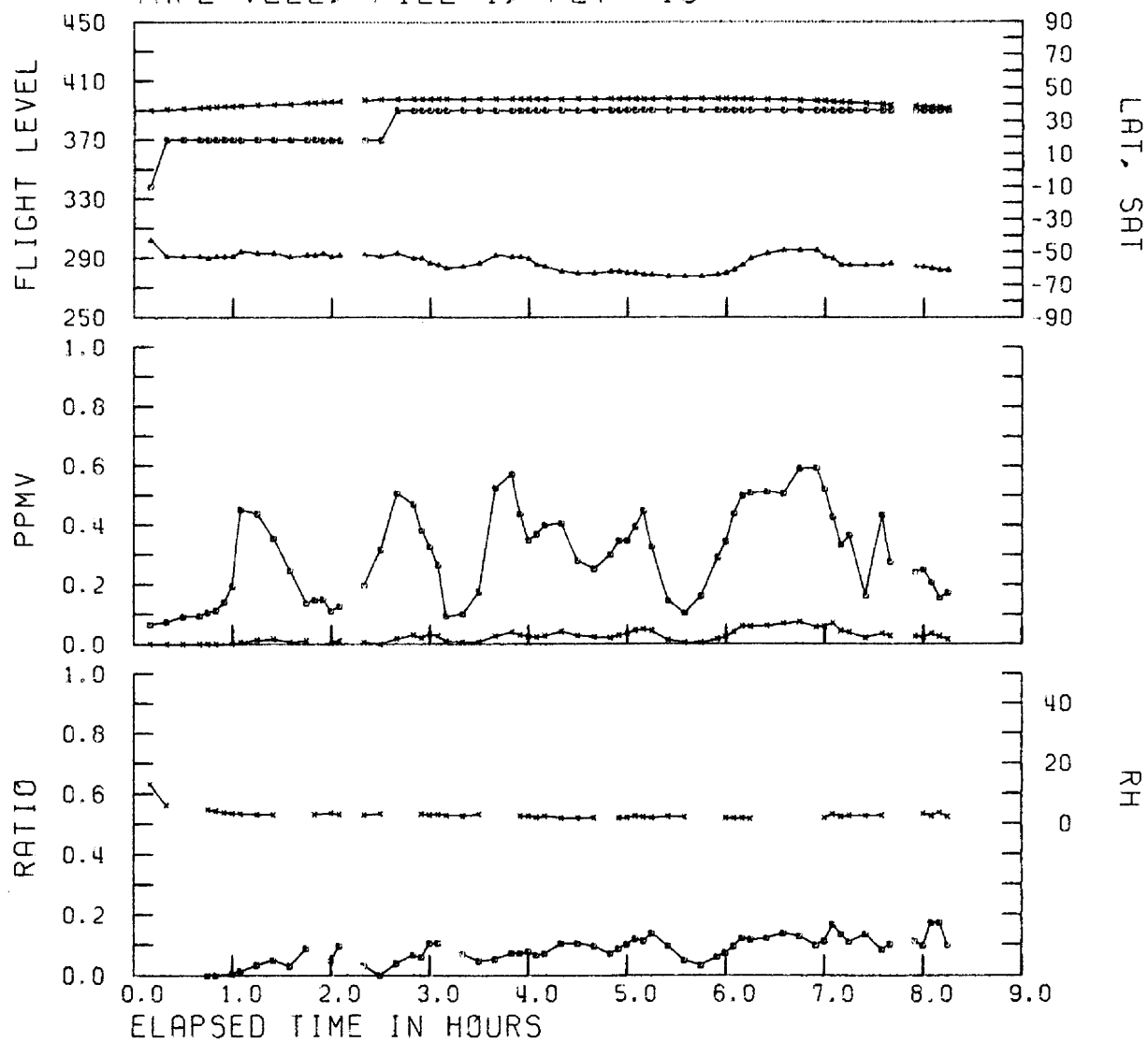
B-300



JFK TO NRT DEPARTURE 9 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 12

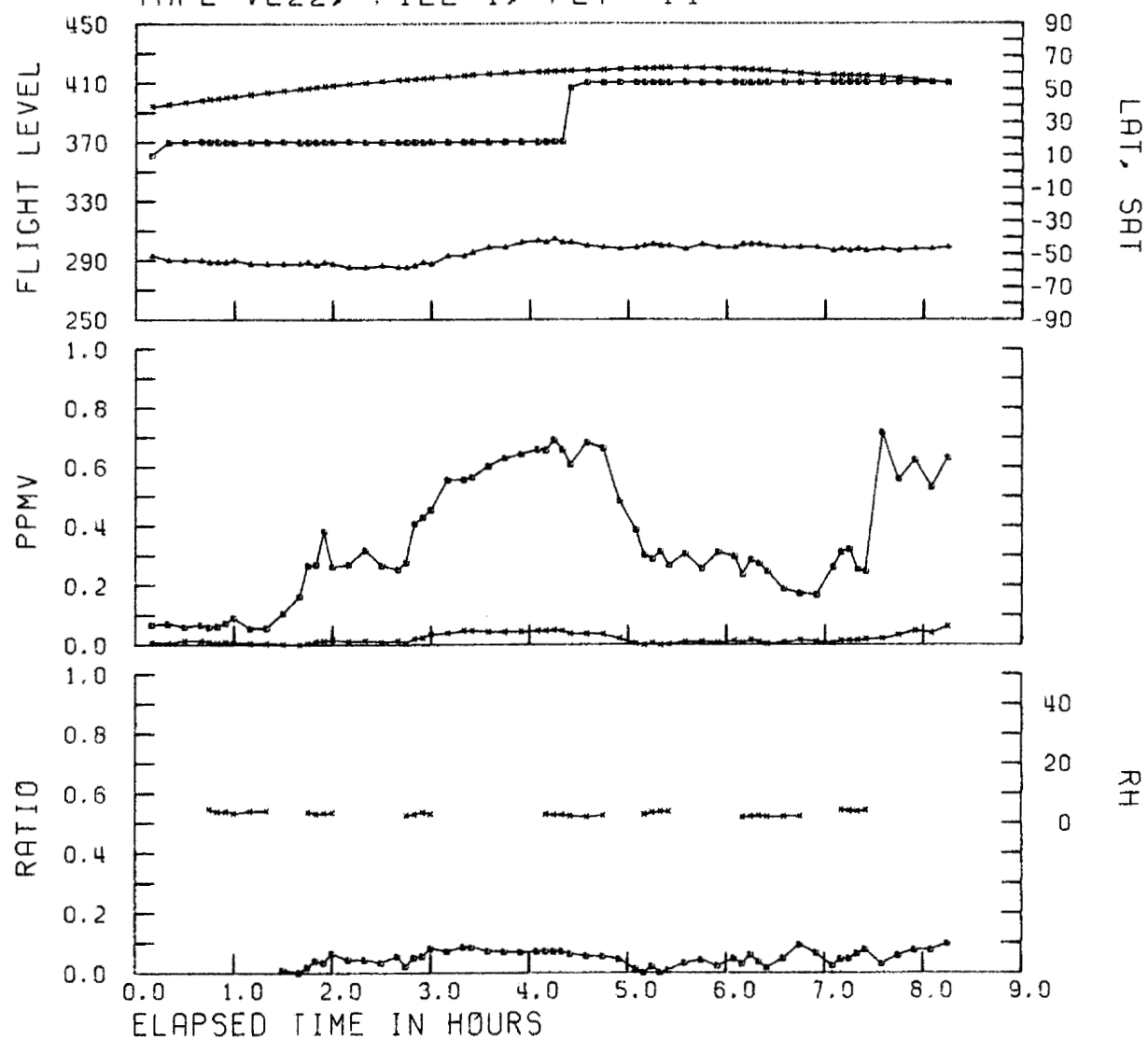


NRT TO SFO DEPARTURE 10 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 13

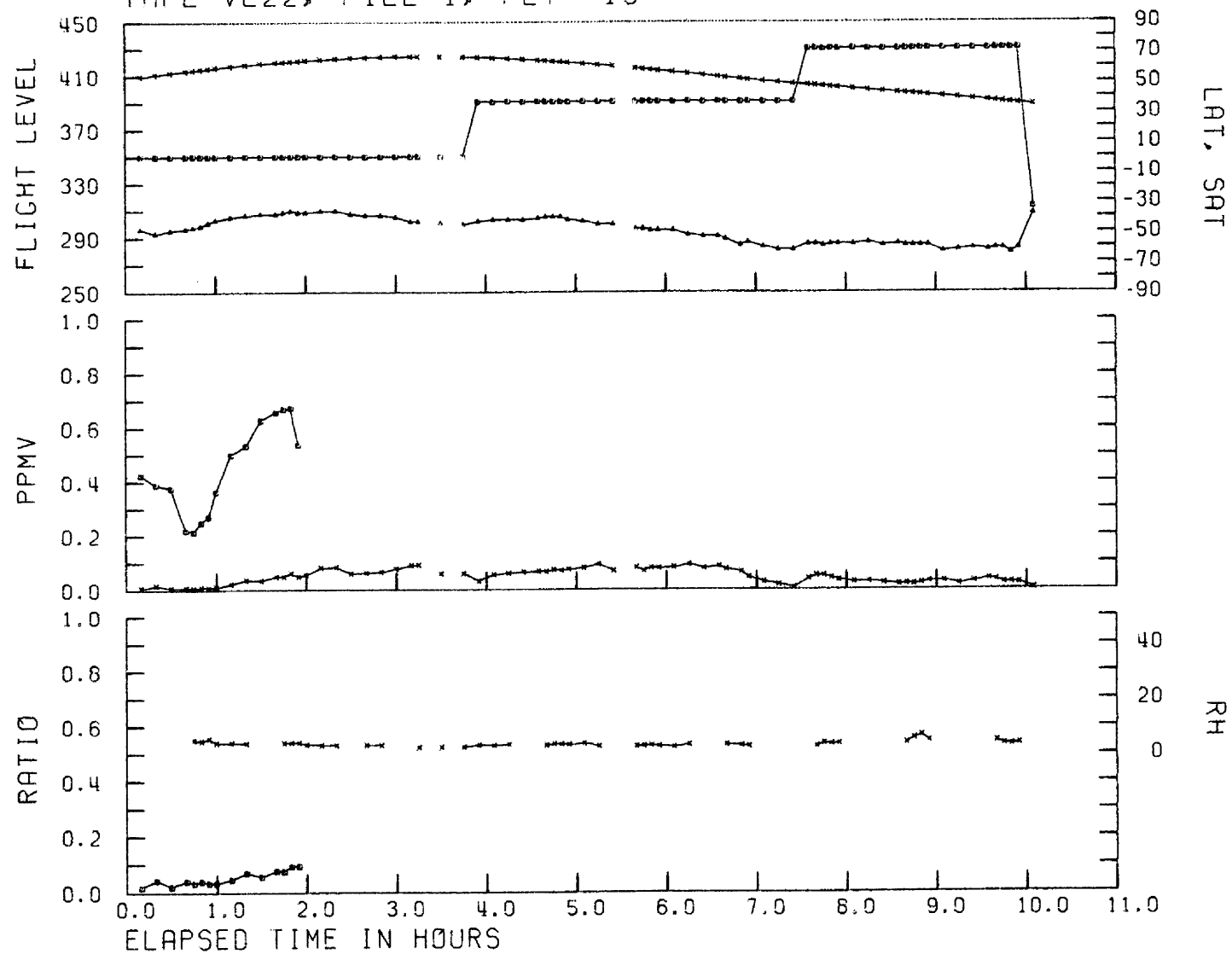


SFO TO LHR DEPARTURE 12 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 14

B-303



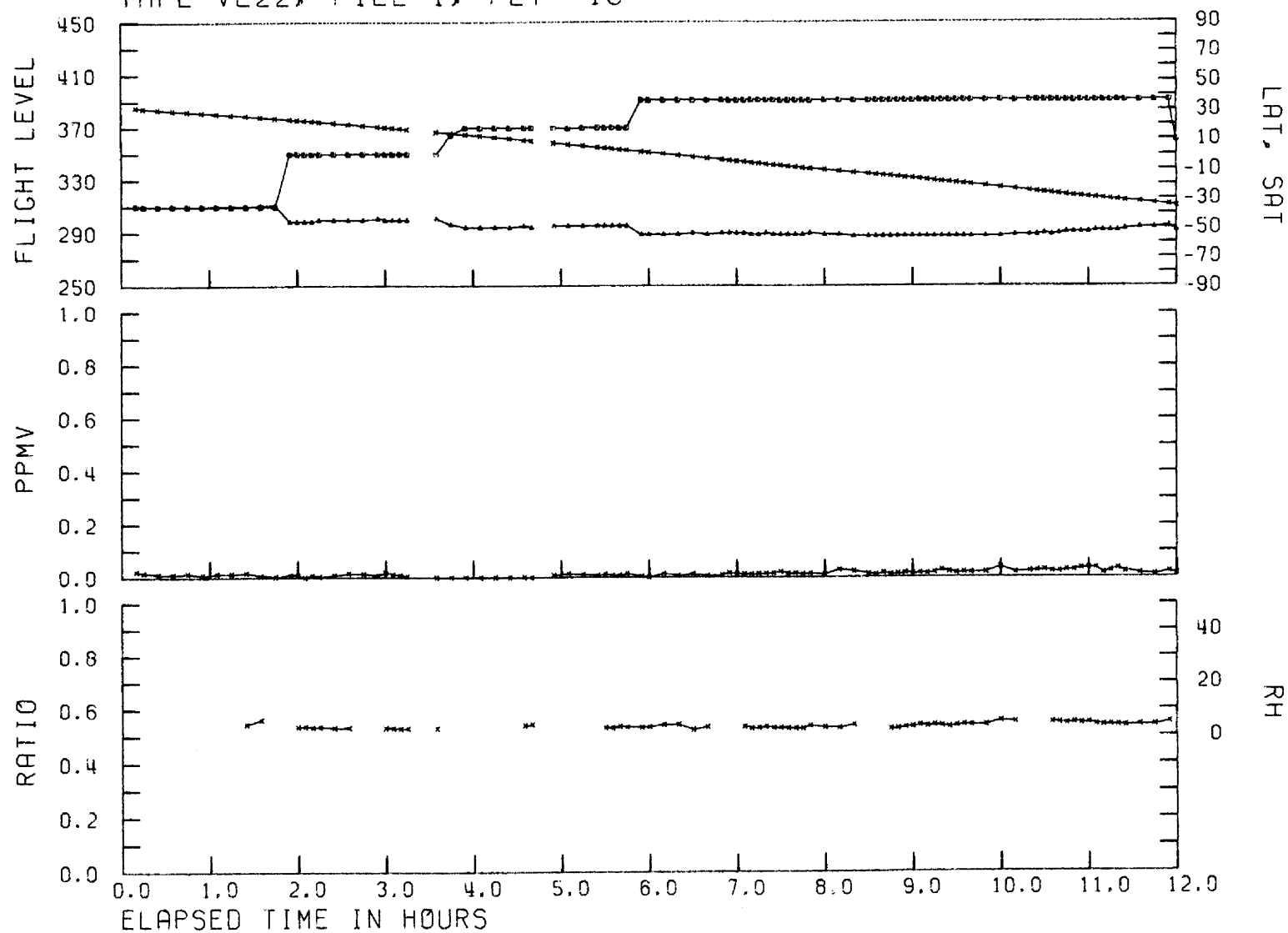
LHR TO LAX DEPARTURE 13 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 15



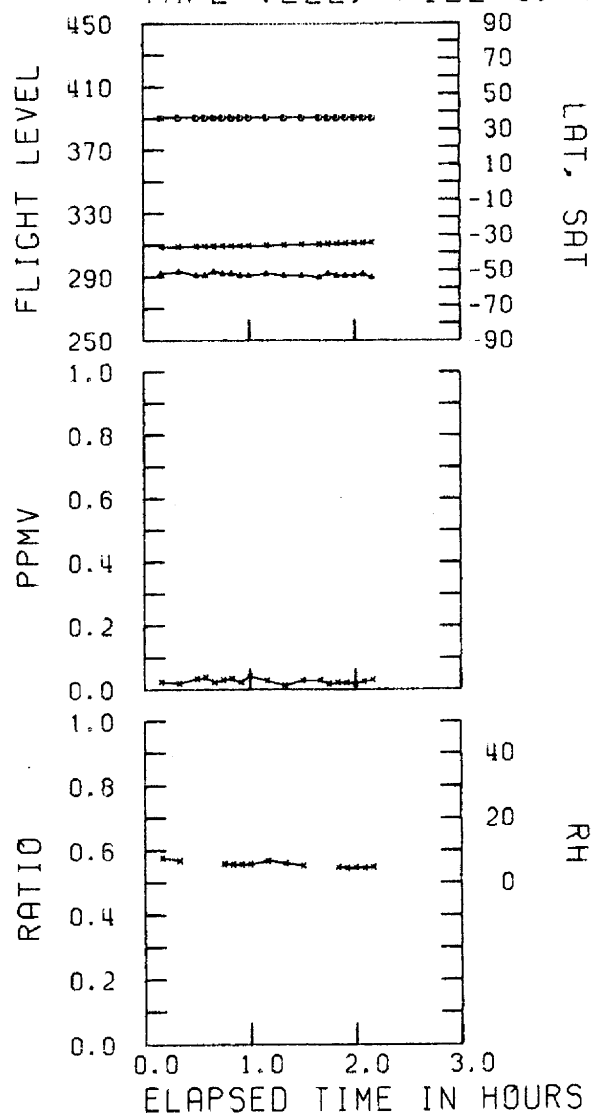
B-304

LAX TO AKL DEPARTURE 14 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 16

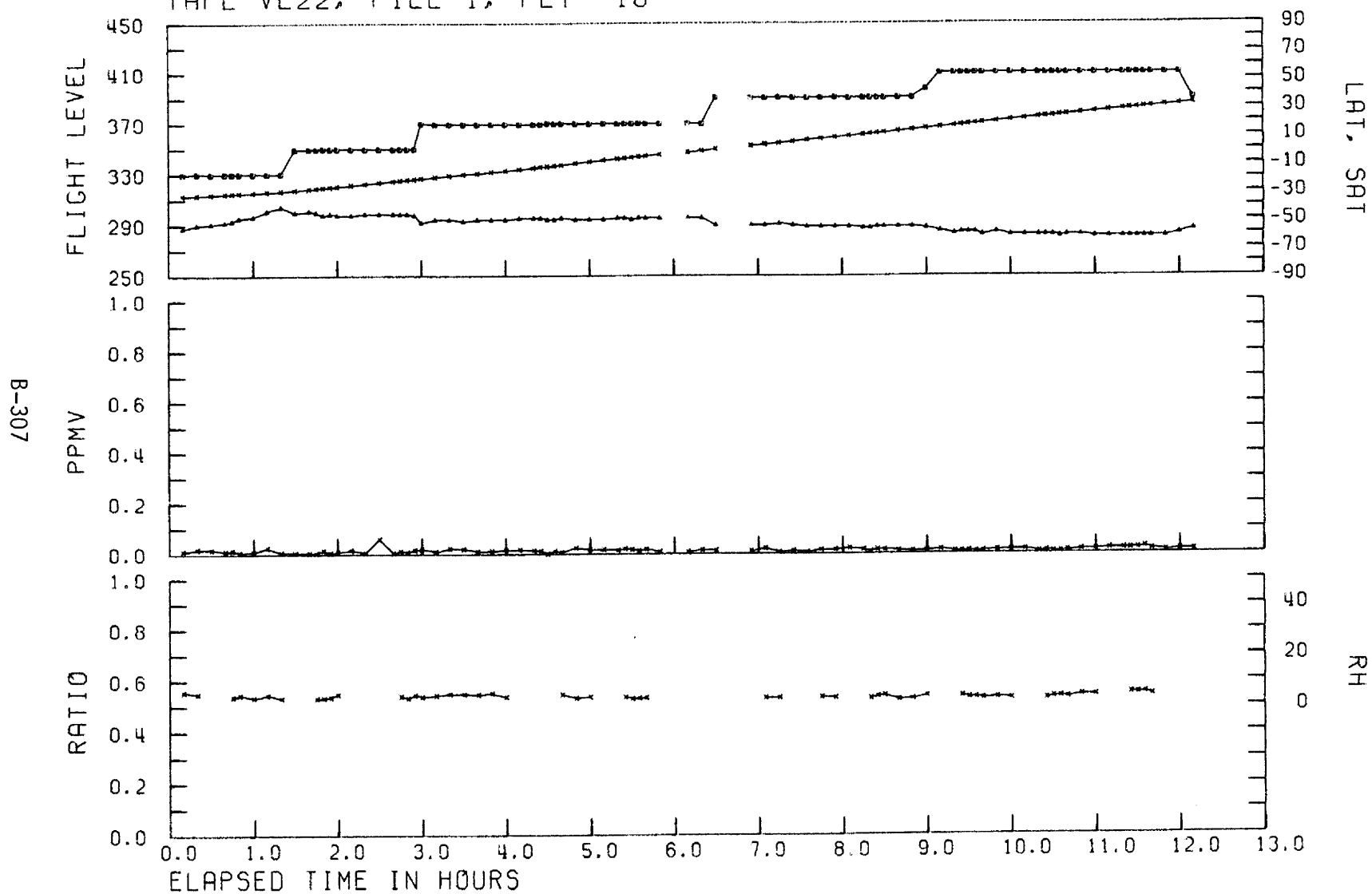
B-305



AKL TO SYD DEPARTURE 14 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 17

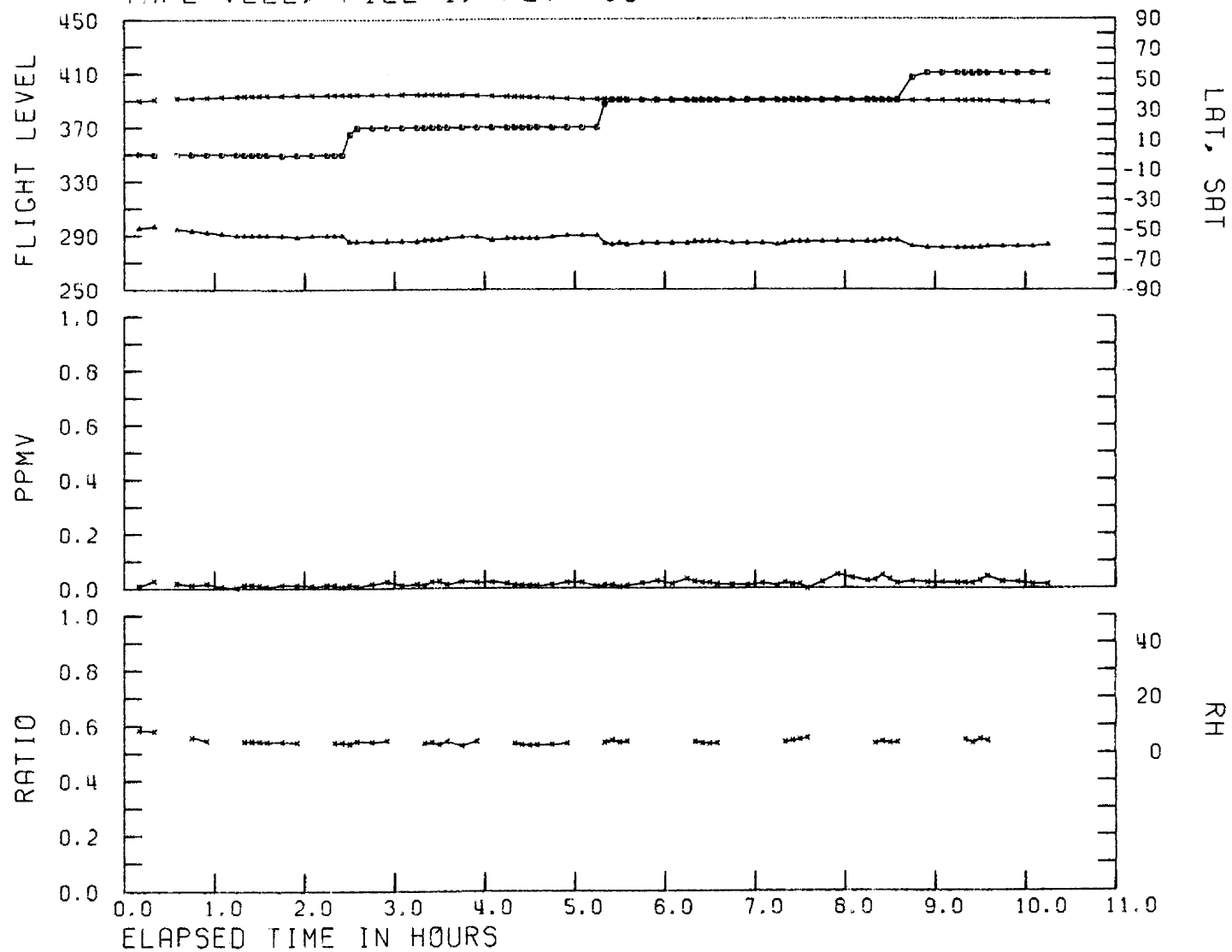


SYD TO LAX DEPARTURE 15 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 18



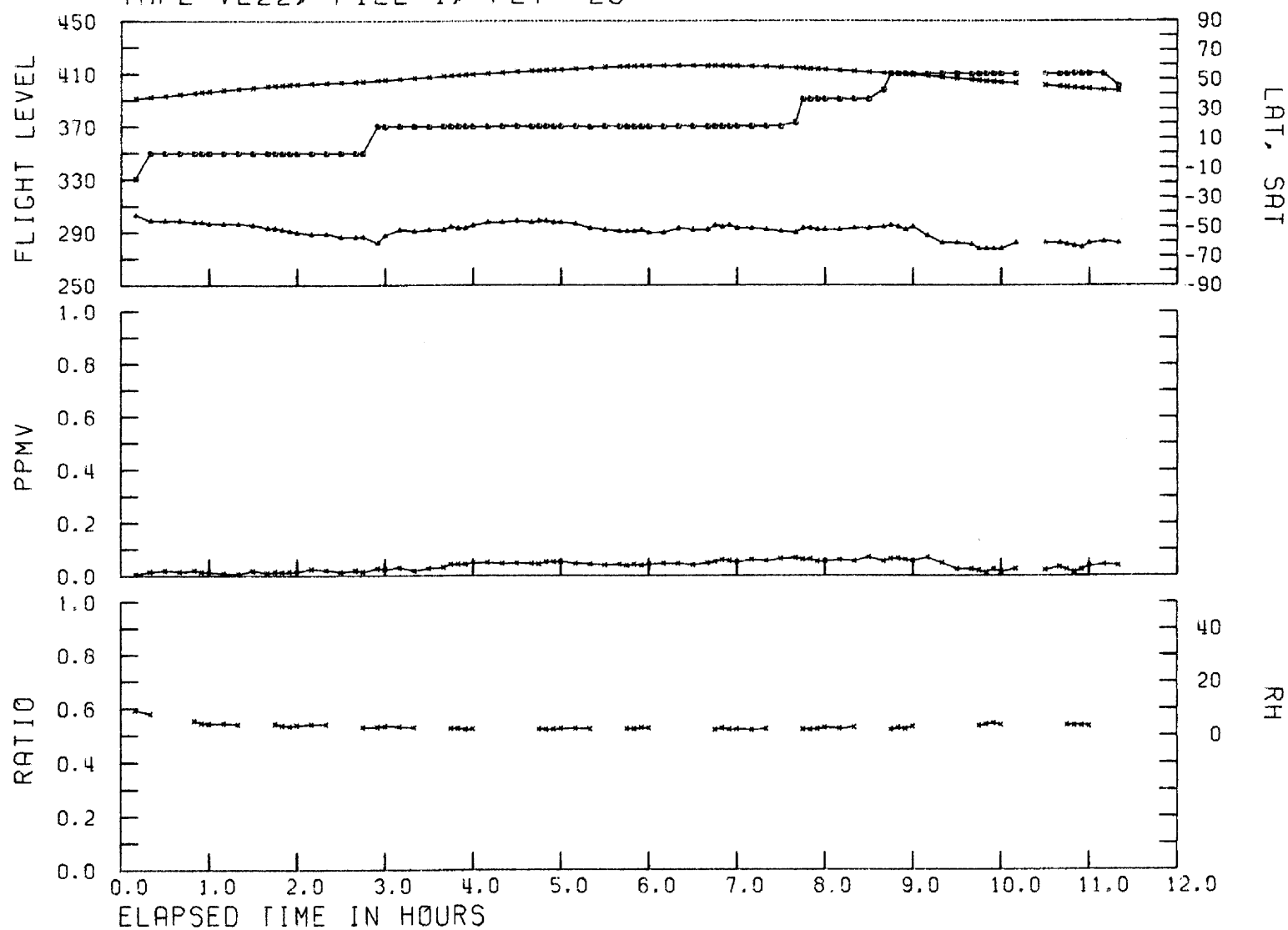
LAX TO NRT DEPARTURE 15 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 19

B-308

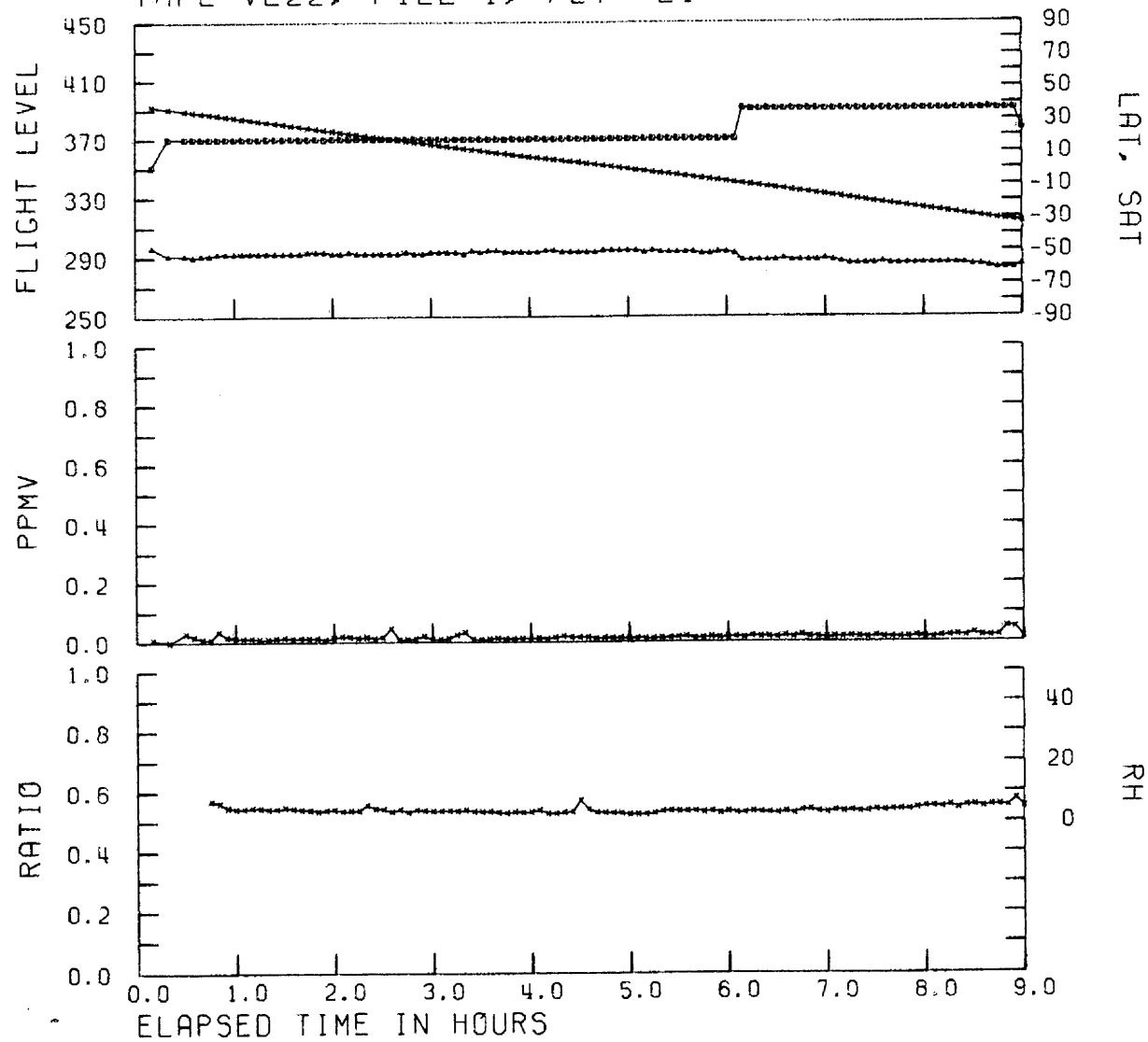


NRT TO JFK DEPARTURE 16 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 20

B-309

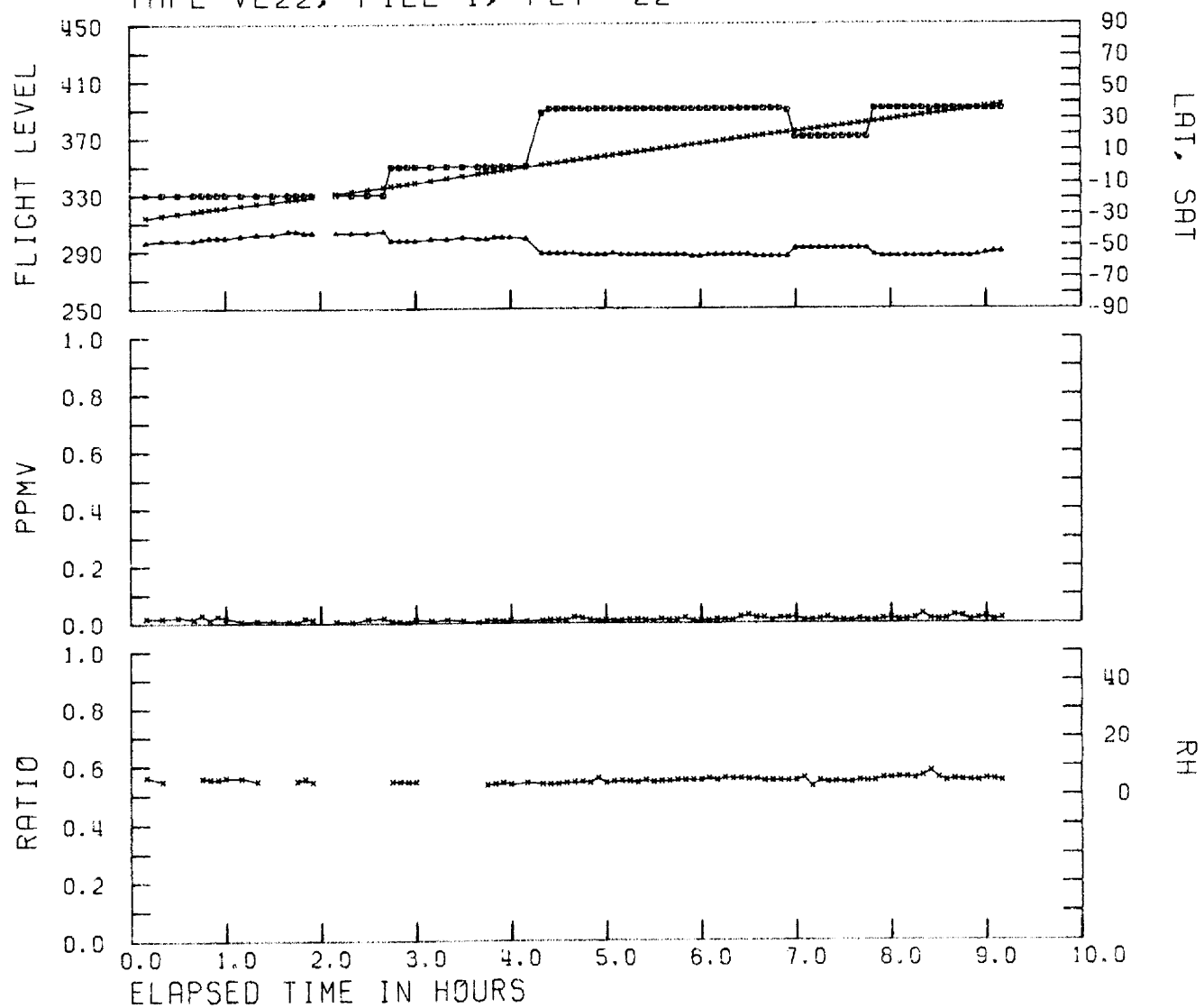


JFK TO EZE DEPARTURE 17 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 21

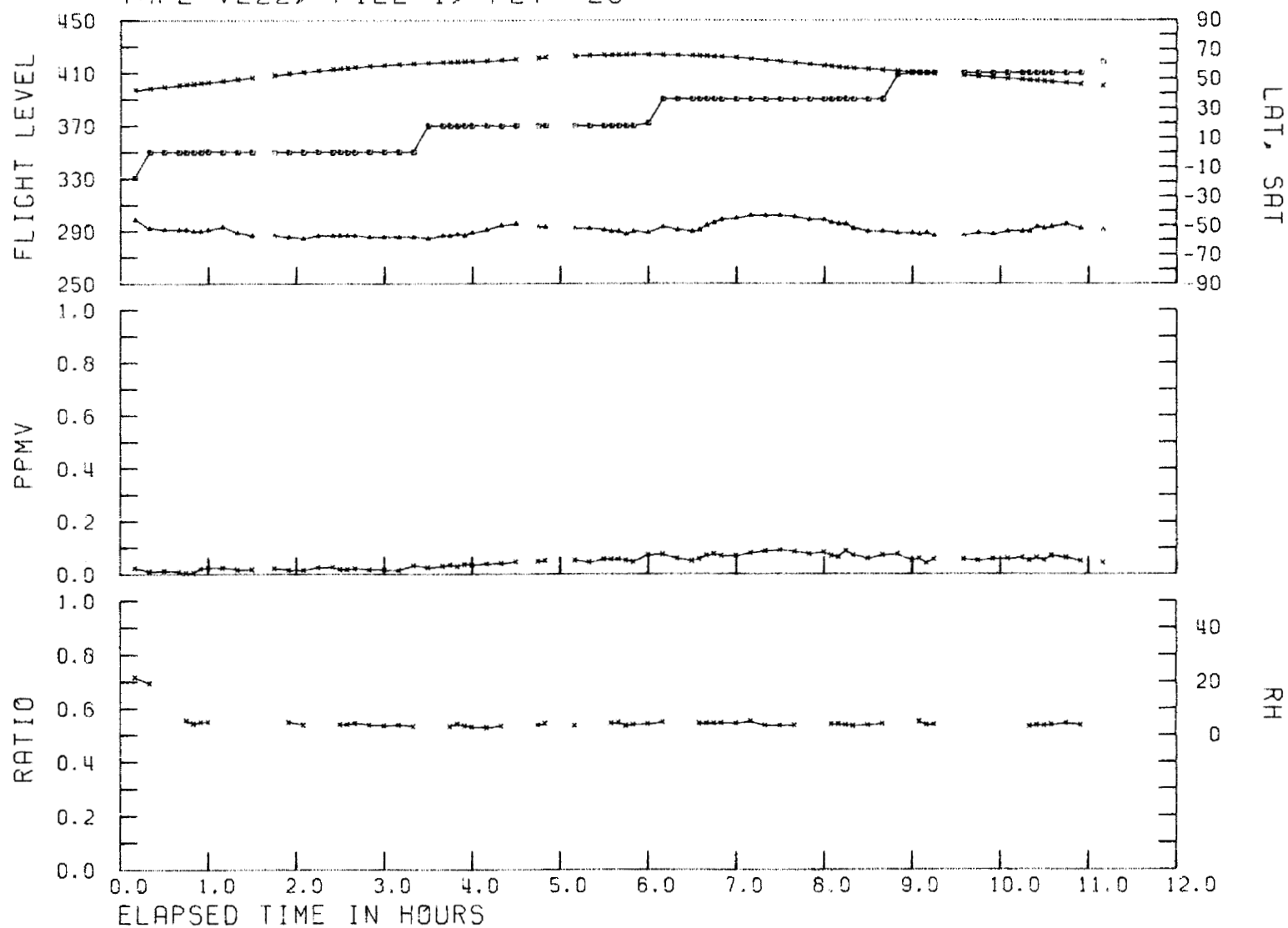


EZE TO JFK DEPARTURE 17 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 22

B-311



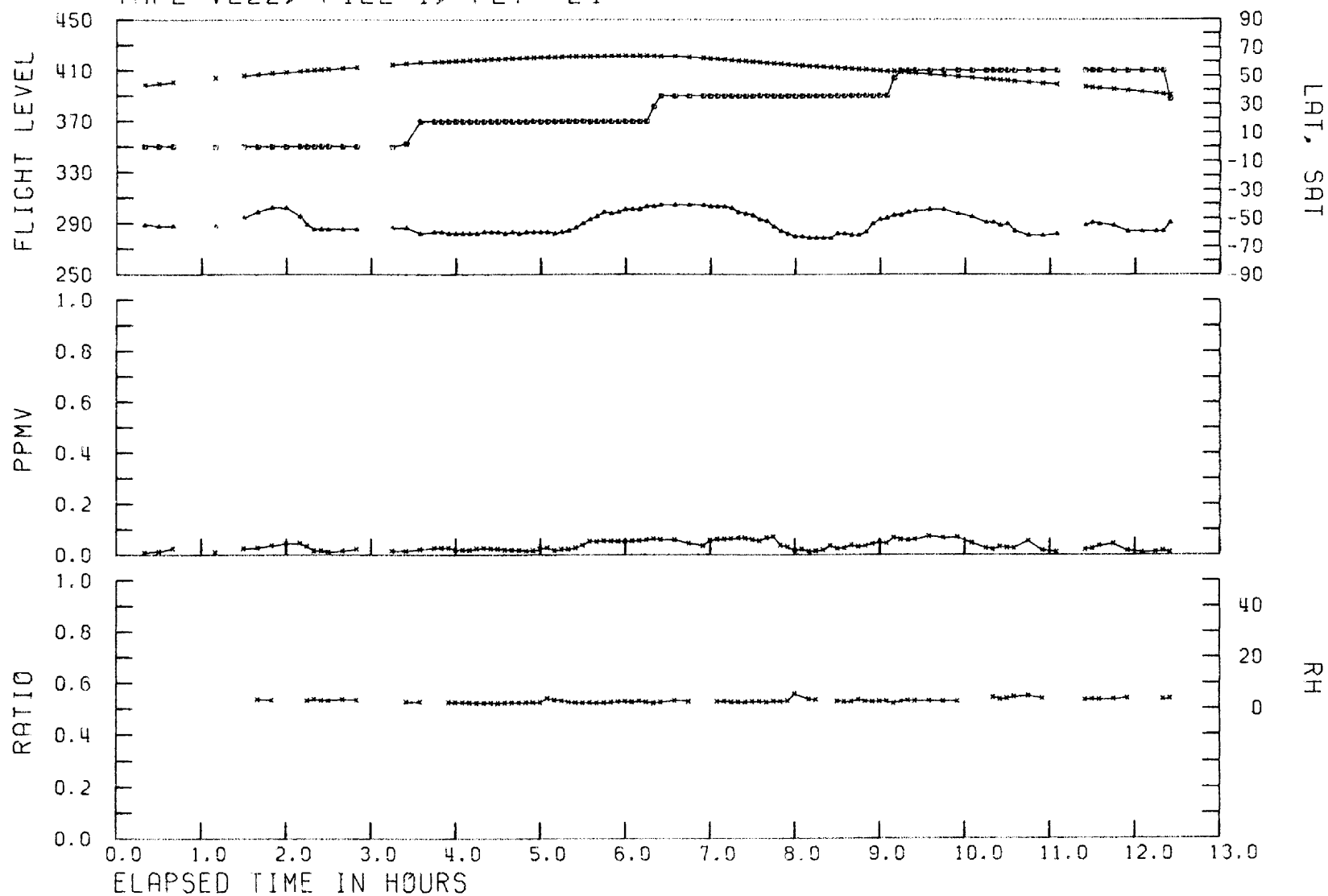
JFK TO NRT DEPARTURE 18 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 23



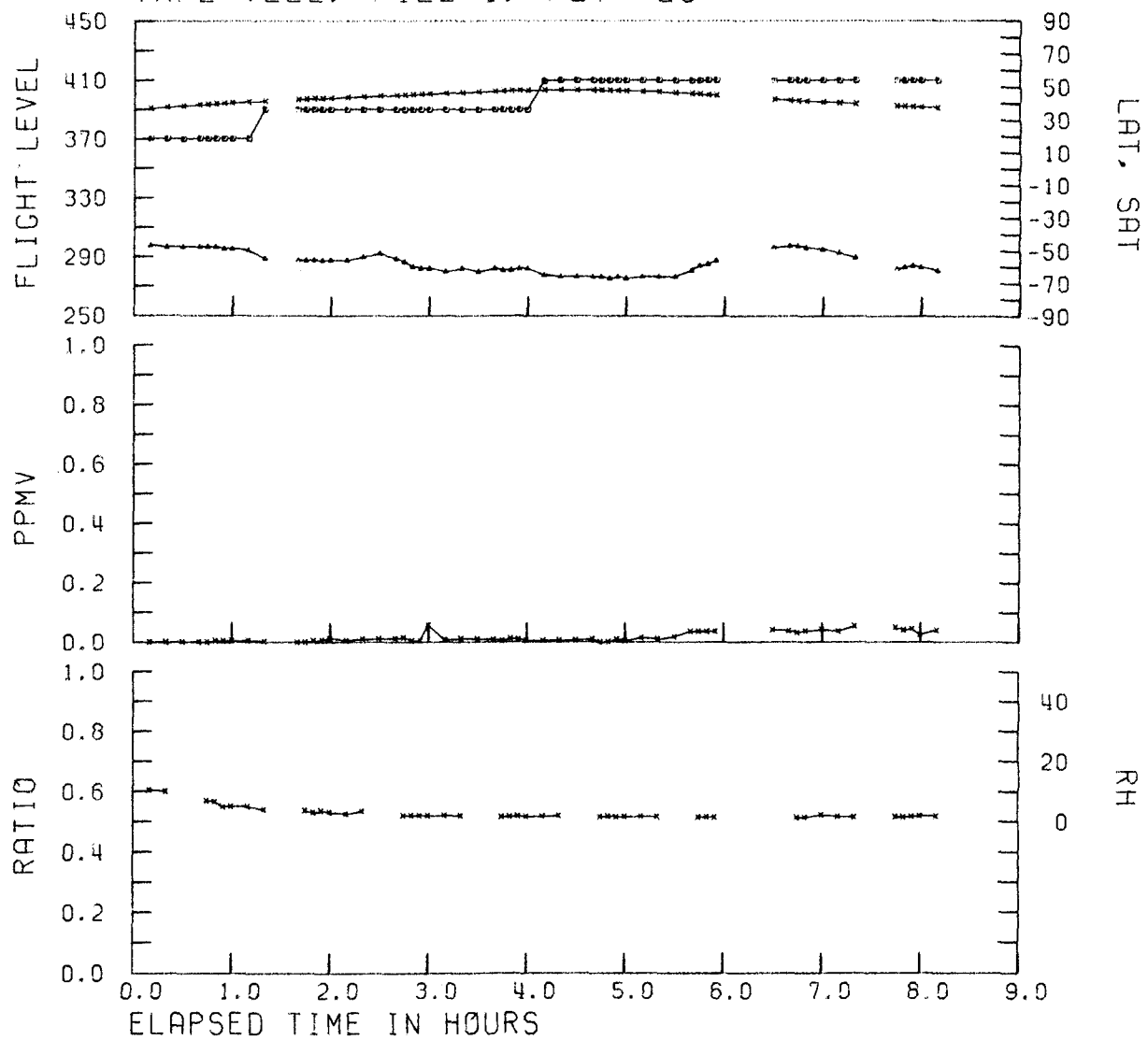
B-312

JFK TO NRT DEPARTURE 26 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 24

B-313

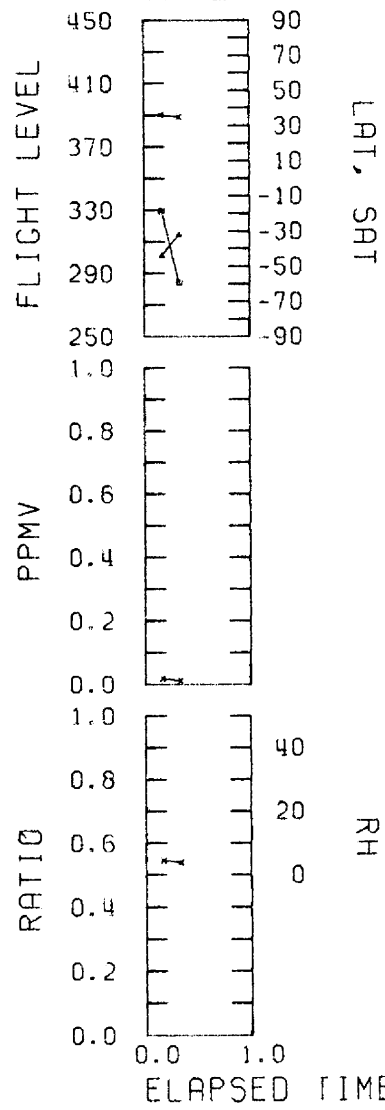


NRT TO SFO DEPARTURE 27 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 25



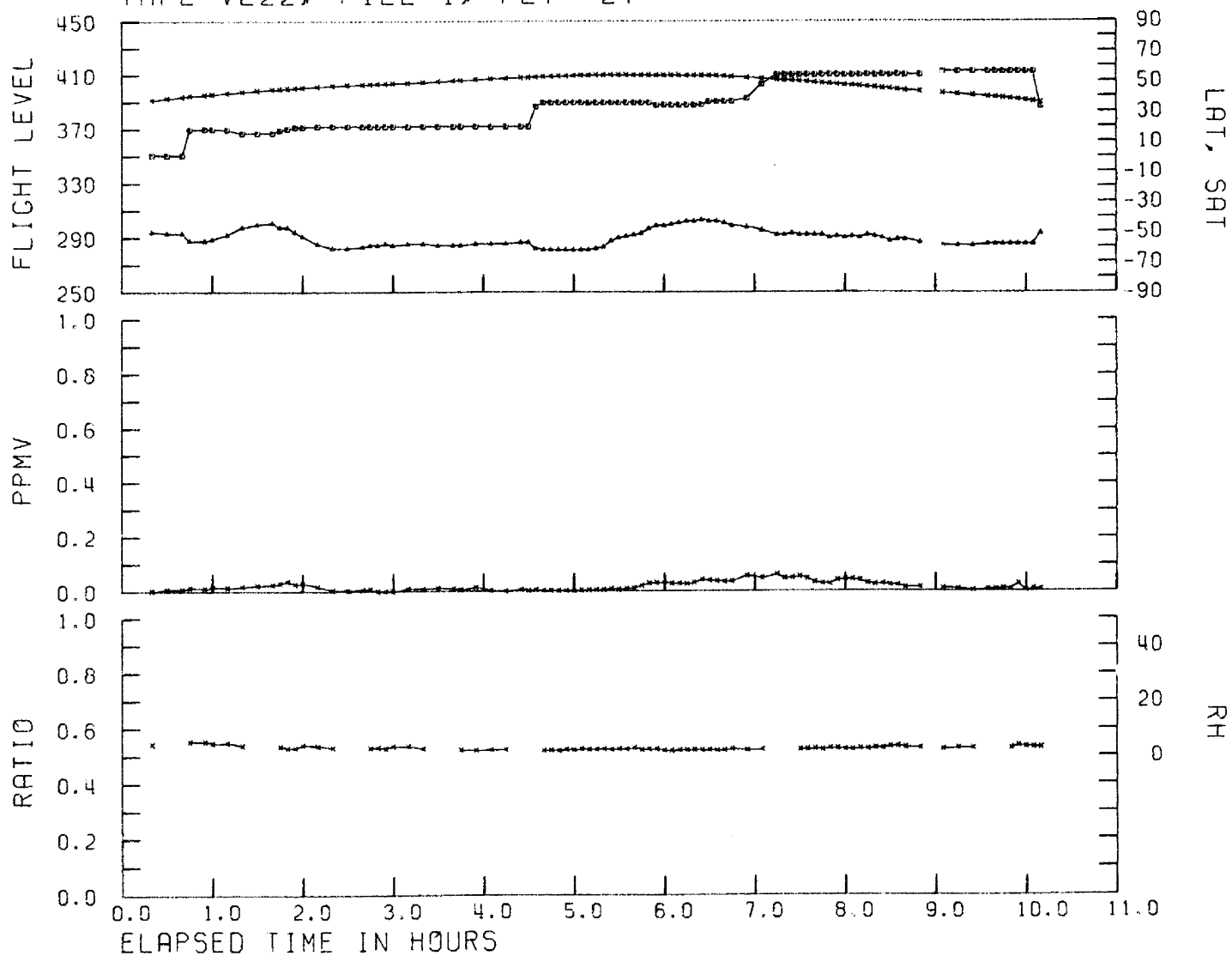
B-314

SFO TO LAX DEPARTURE 28 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 26



B-315

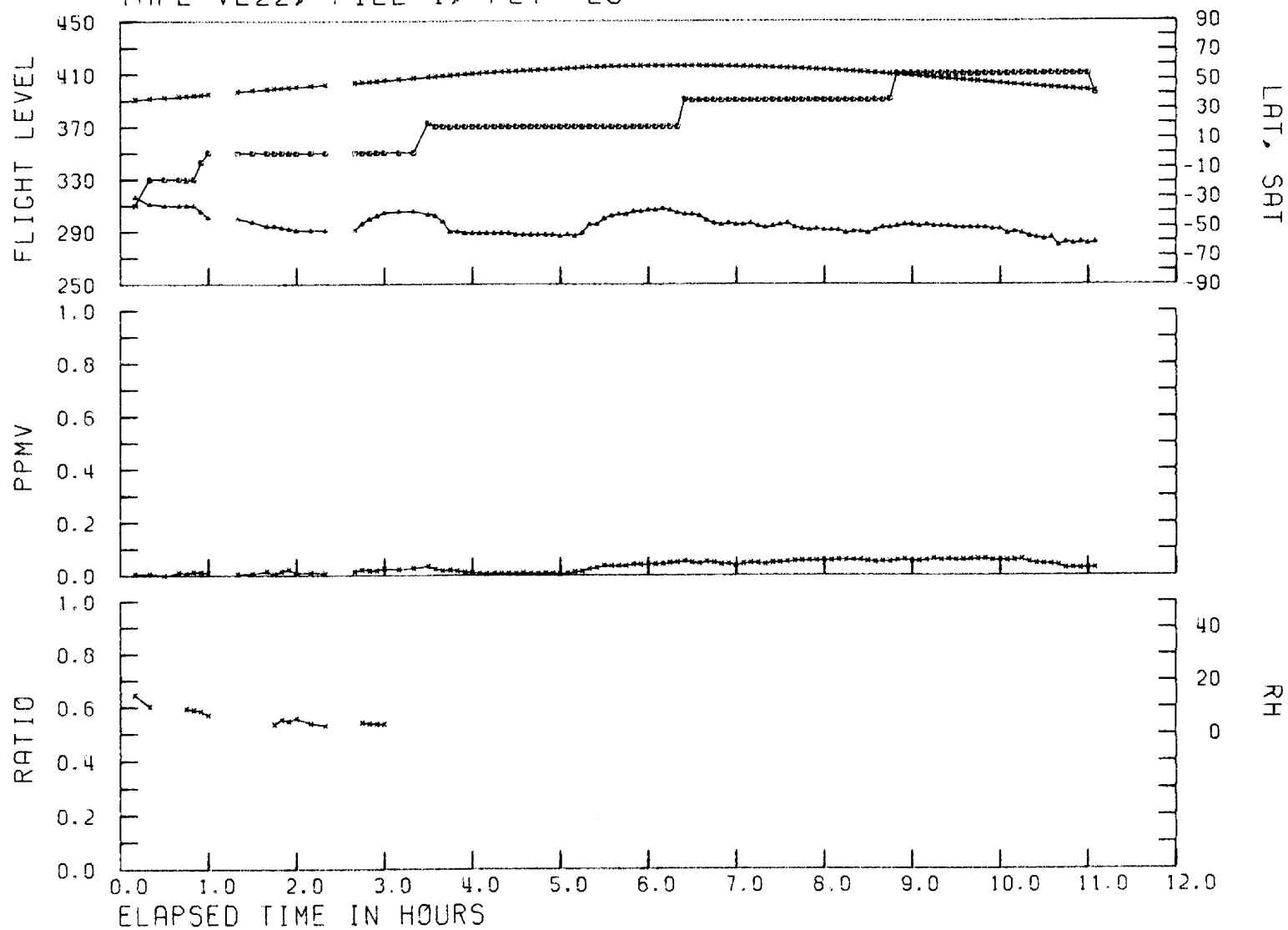
LAX TO NRT DEPARTURE 28 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 27



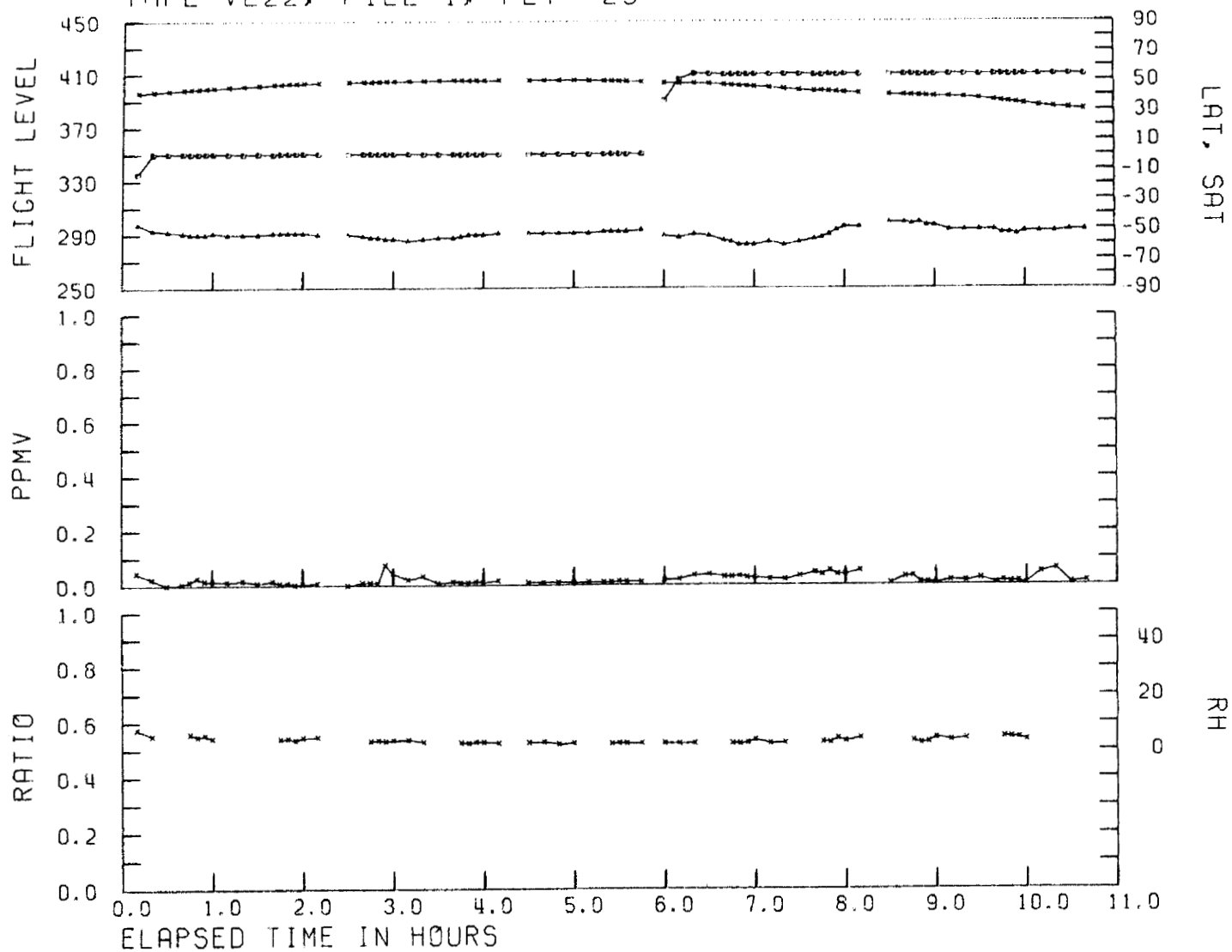
B-316

NRT TO JFK DEPARTURE 29 JUN 79 PANAM -N533PA
TAPE VL22, FILE 1, FLT 28

B-317



JFK TO DHA DEPARTURE 30 JUN 79 PANAM -N533PA
 TAPE VL22, FILE 1, FLT 29



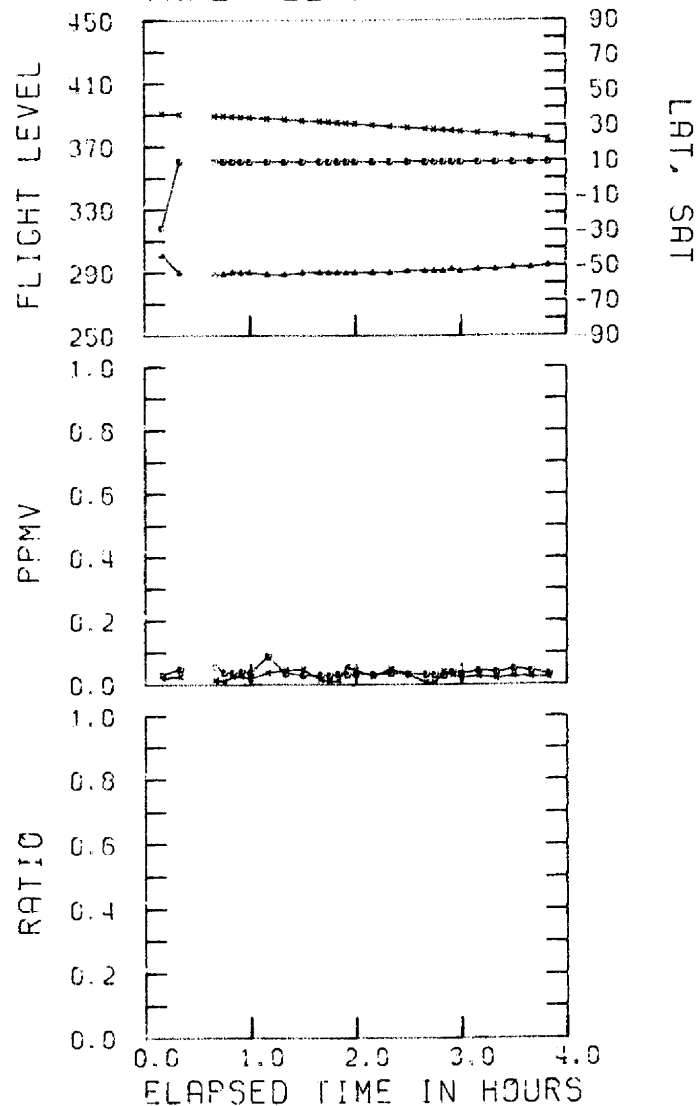
B-318

APPENDIX C

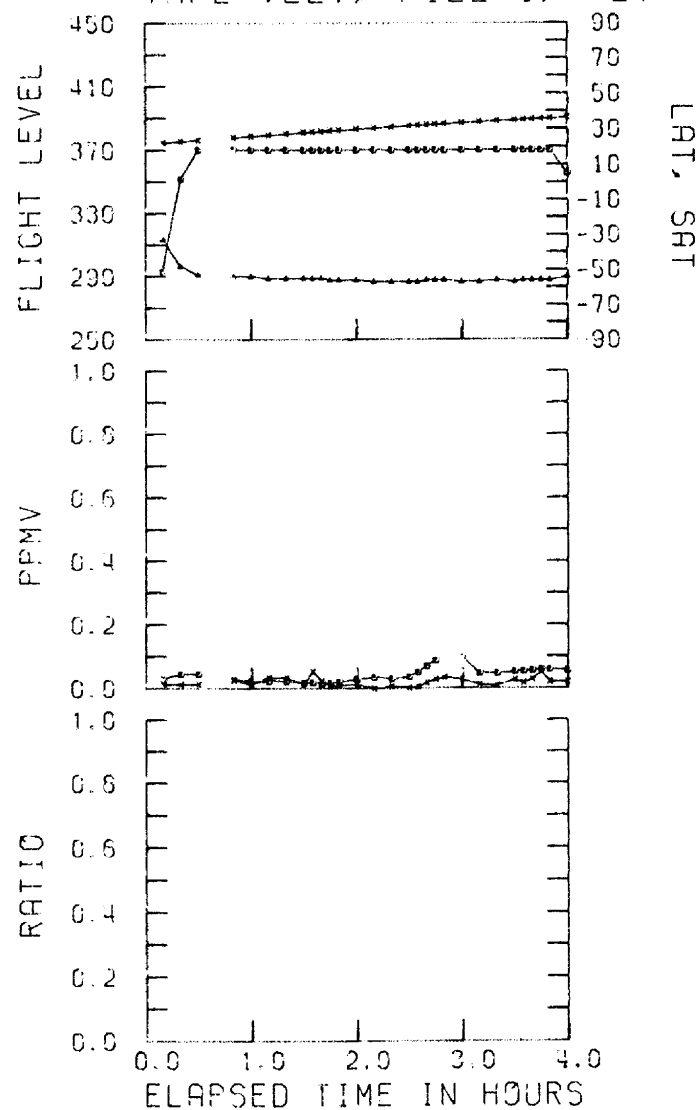
FLIGHT PLOTS OF CABIN AND AMBIENT OZONE DATA FOR N4711U (747-100)
FOR THE PERIOD 10/7/78 to 7/12/79

C-2

SFO TO HNL DEPARTURE 7 OCT 78
TAPE VL27, FILE 1, FLT 1

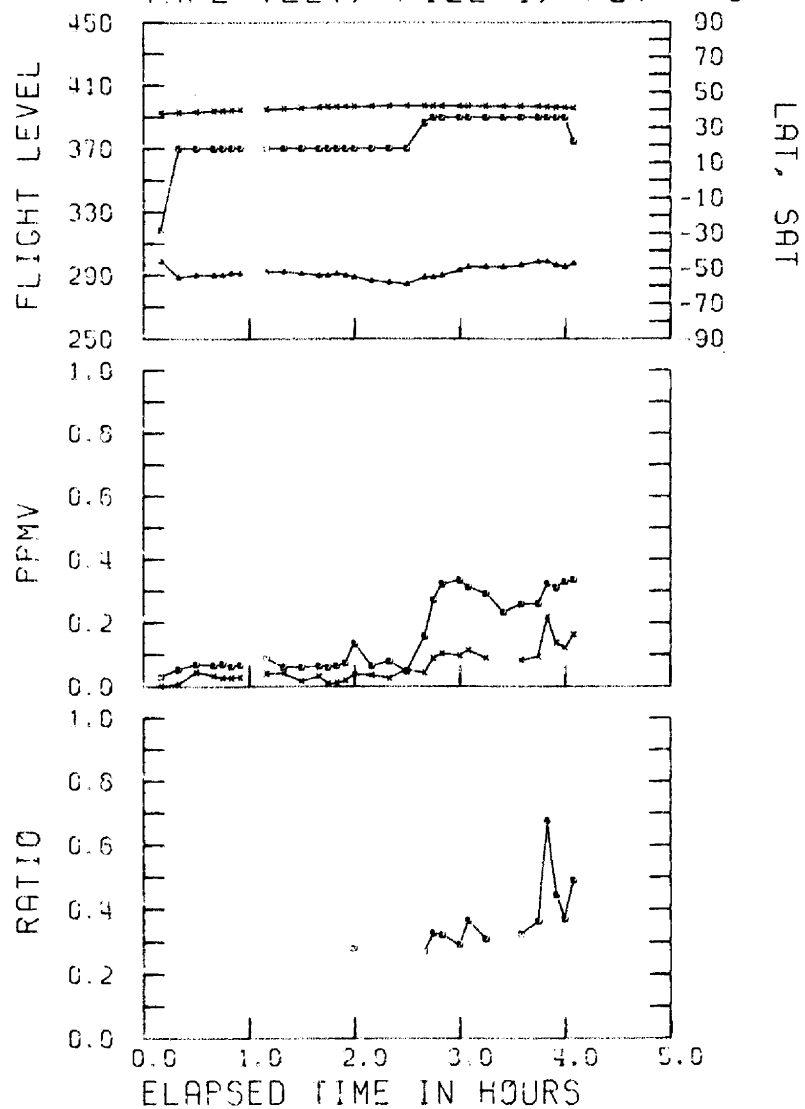


HNL TO SFO DEPARTURE 7 OCT 78
TAPE VL27, FILE 1, FLT 2

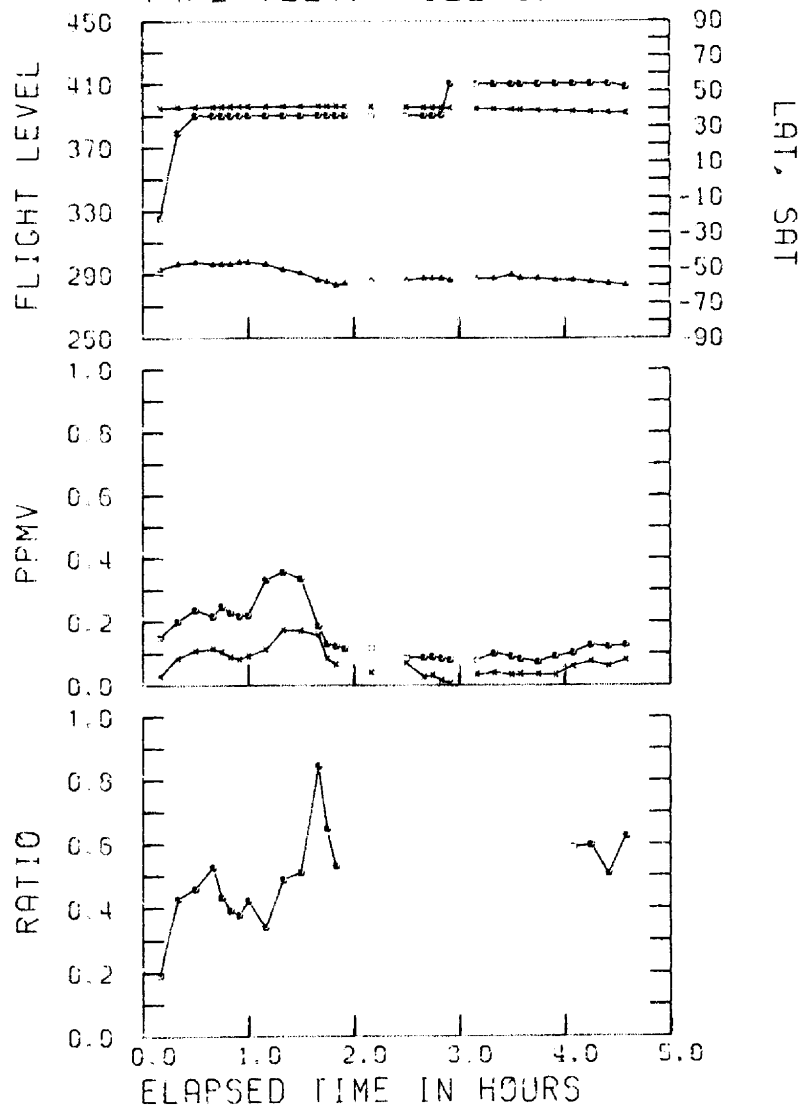


8-3

SFO TO JFK DEPARTURE 7 OCT 78
TAPE VL27, FILE 1, FLT 3

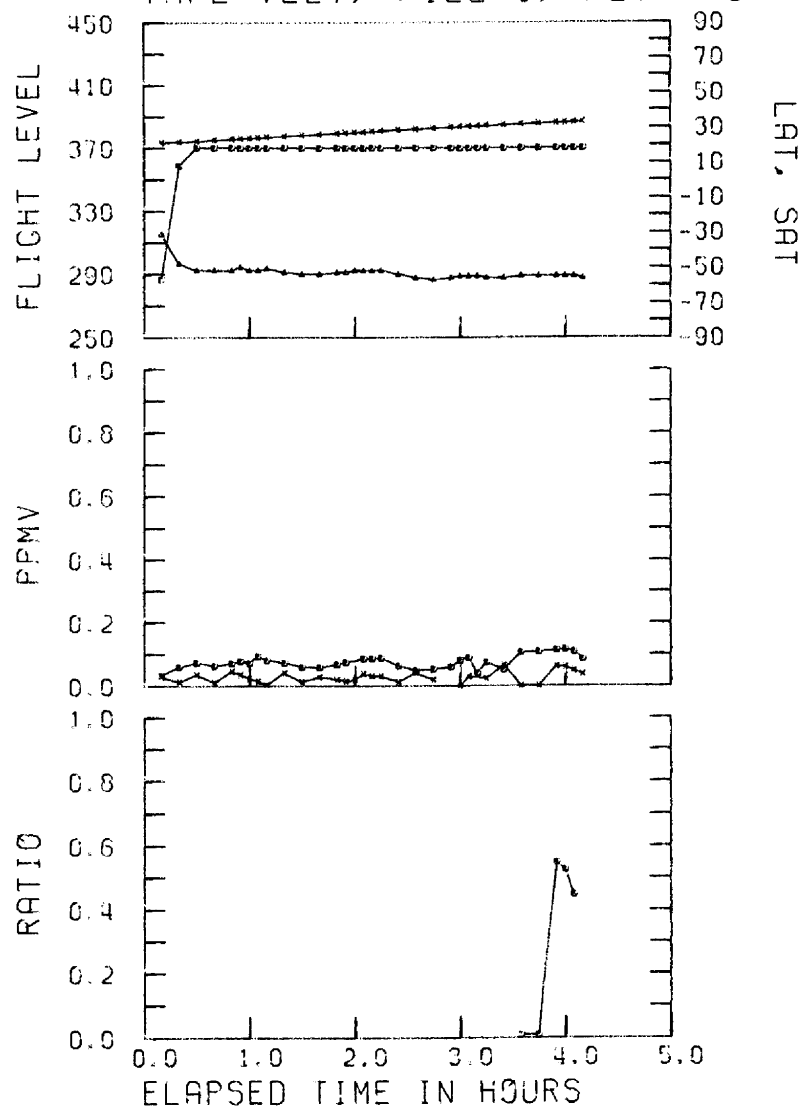


JFK TO SFO DEPARTURE 7 OCT 78
TAPE VL27, FILE 1, FLT 4

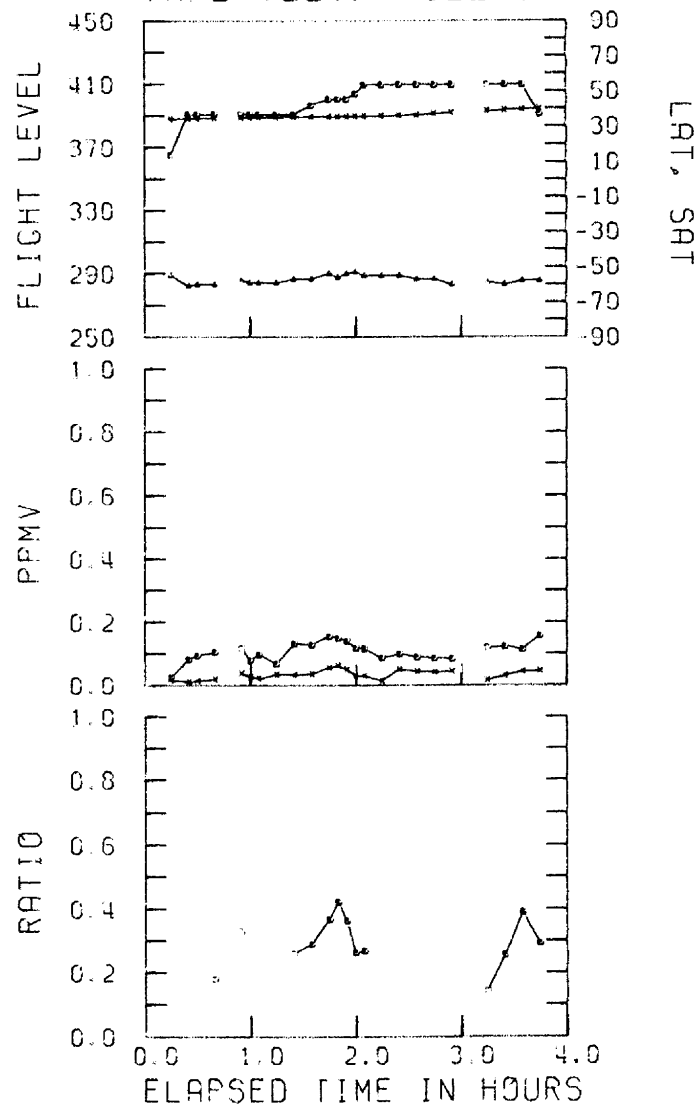


C-4

HNL TO LAX DEPARTURE 8 OCT 78
TAPE VL27, FILE 1, FLT 5

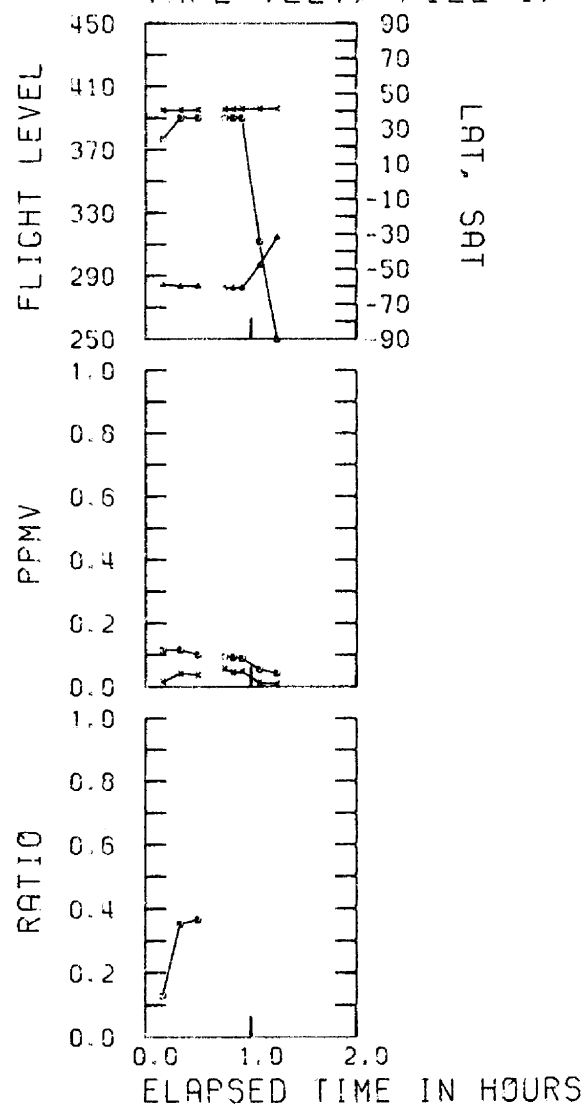


LAX TO JFK DEPARTURE 9 OCT 78
TAPE VL27, FILE 1, FLT 6

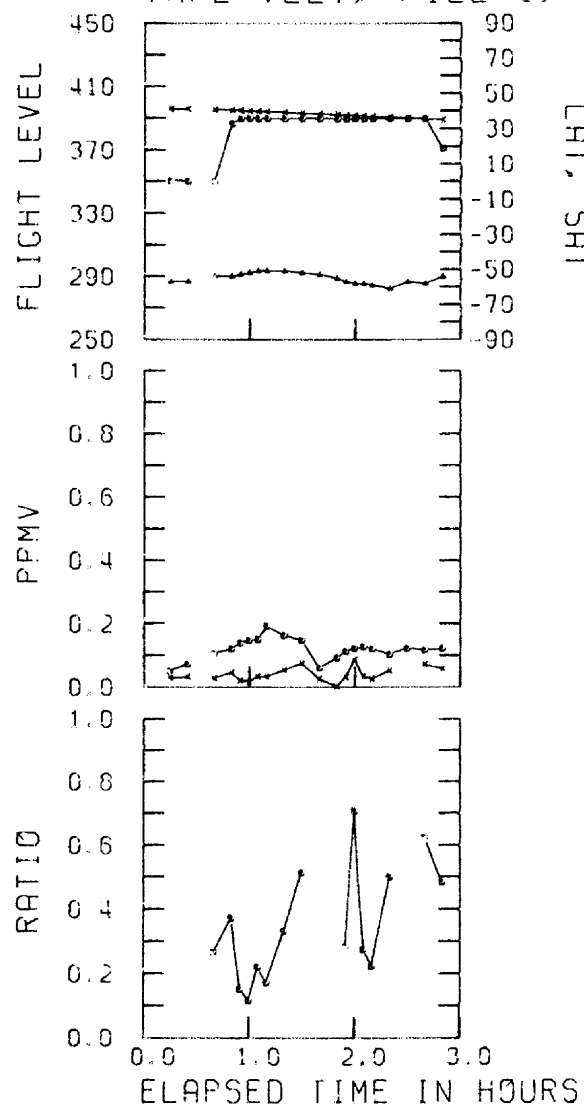


C-5

JFK TO ORD DEPARTURE 9 OCT 78
TAPE VL27, FILE 1, FLT 7

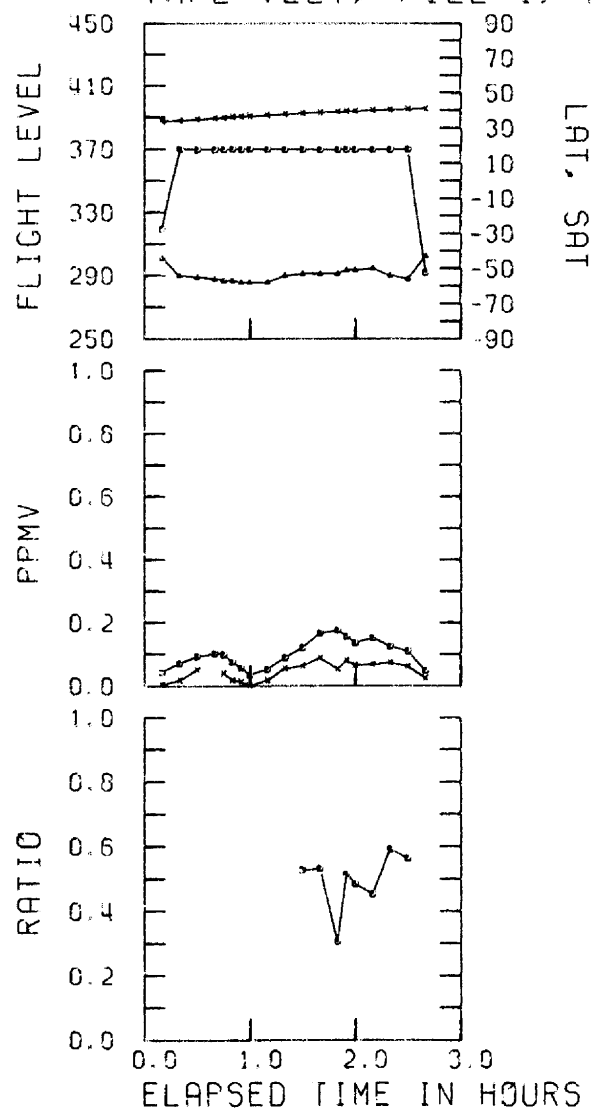


ORD TO LAX DEPARTURE 9 OCT 78
TAPE VL27, FILE 1, FLT 8

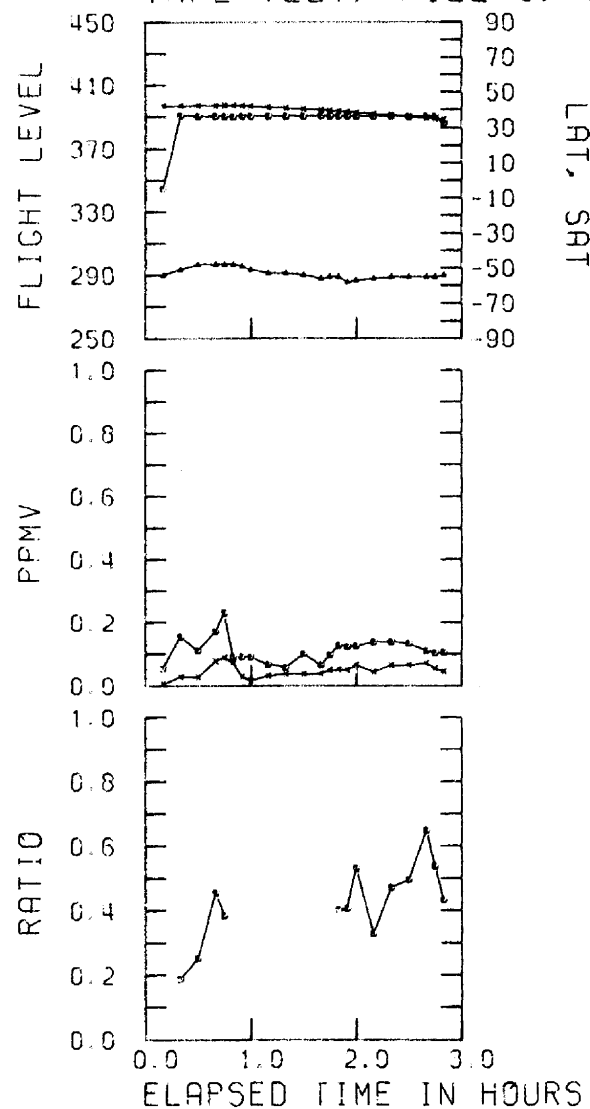


9-C

LAX TO ORD DEPARTURE 9 OCT 78
TAPE VL27, FILE 1, FLT 9

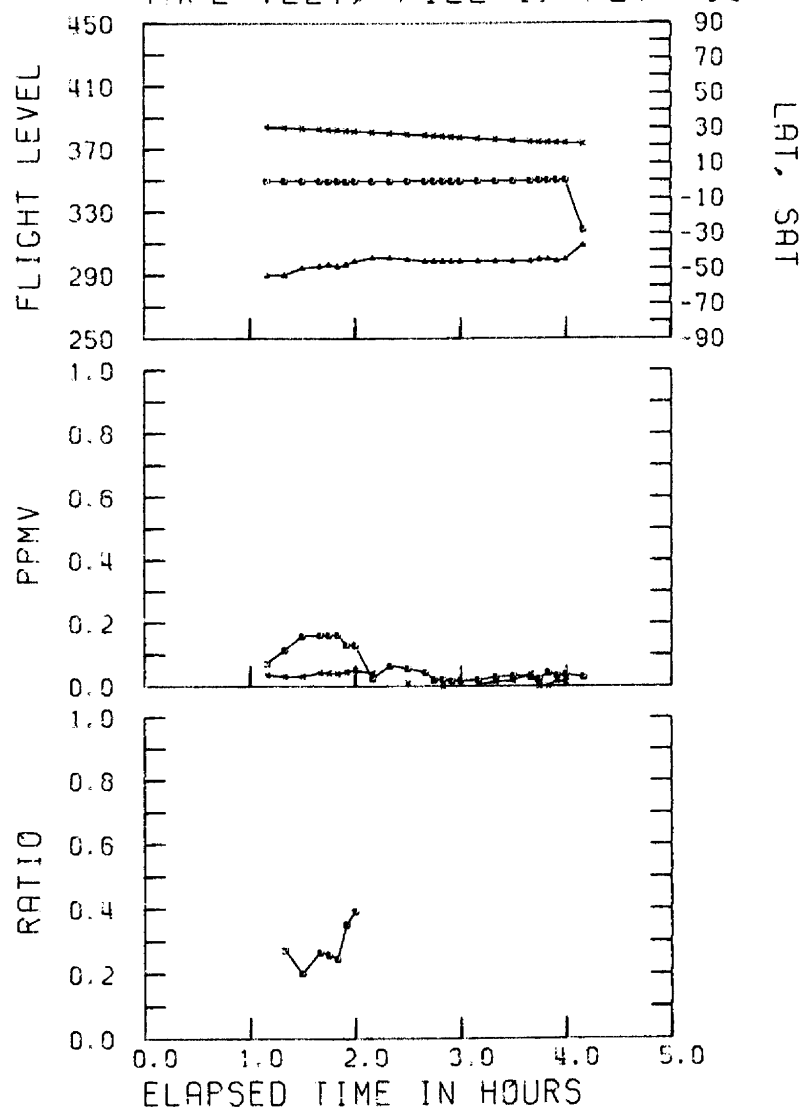


ORD TO LAX DEPARTURE 10 OCT 78
TAPE VL27, FILE 1, FLT 10

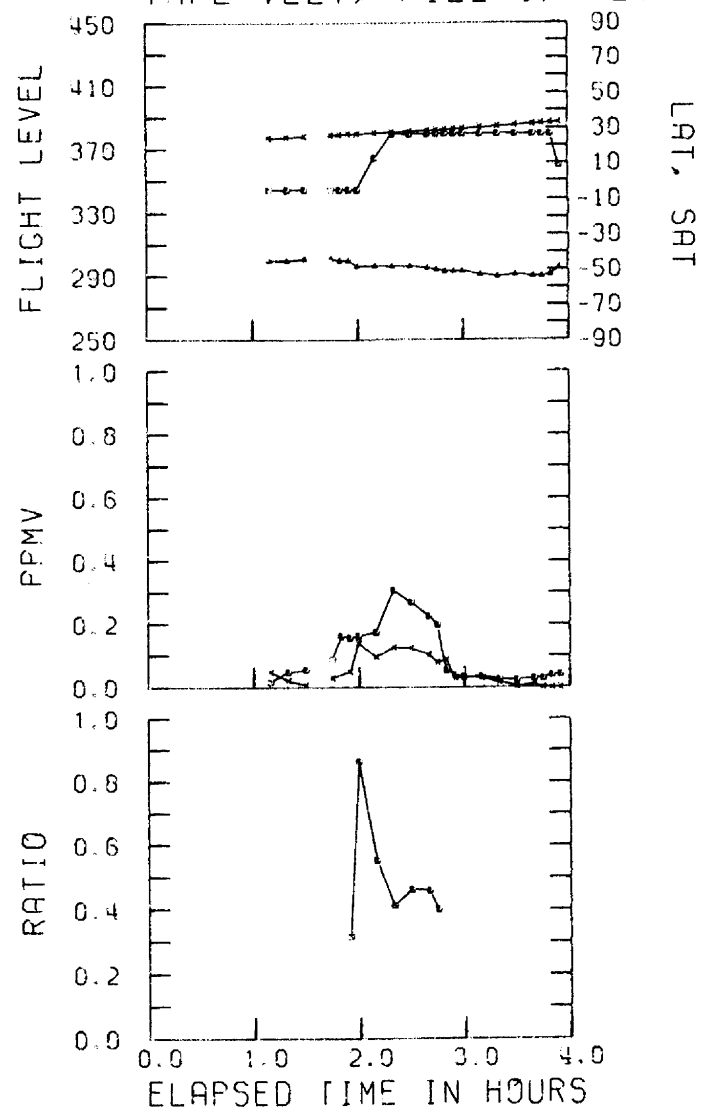


C-7

LAX TO HNL DEPARTURE 10 OCT 78
TAPE VL27, FILE 1, FLT 11

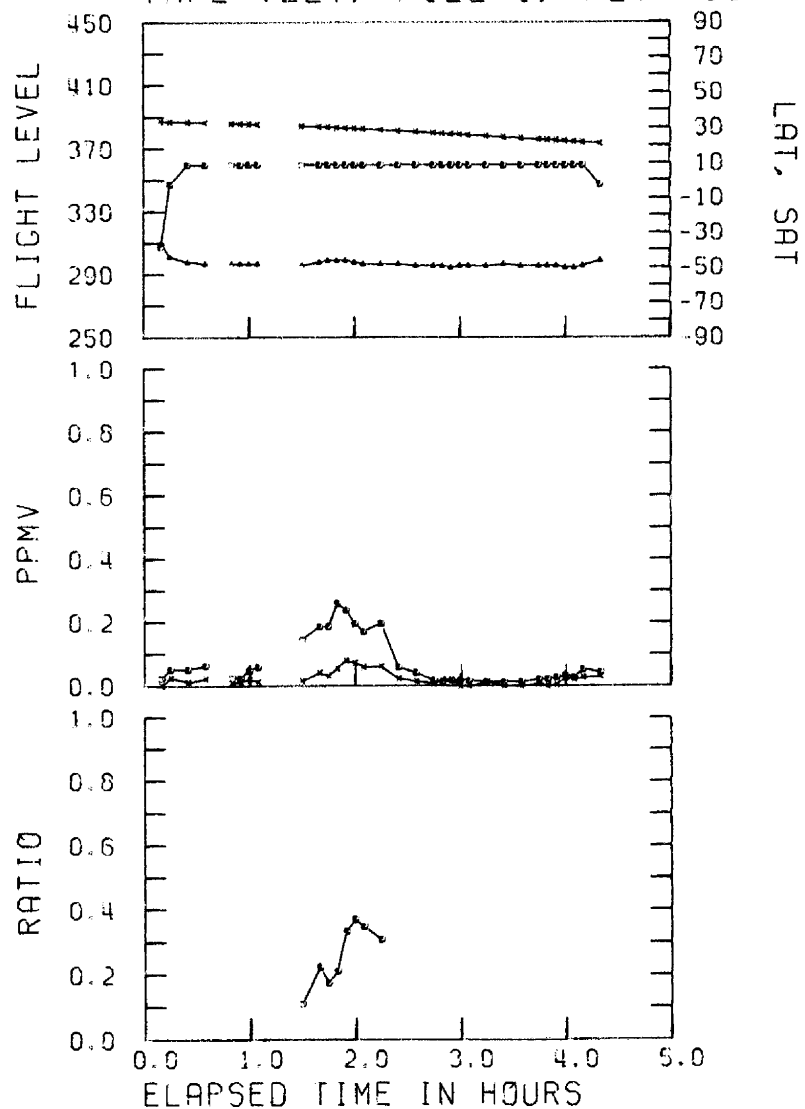


ITO TO LAX DEPARTURE 11 OCT 78
TAPE VL27, FILE 1, FLT 12

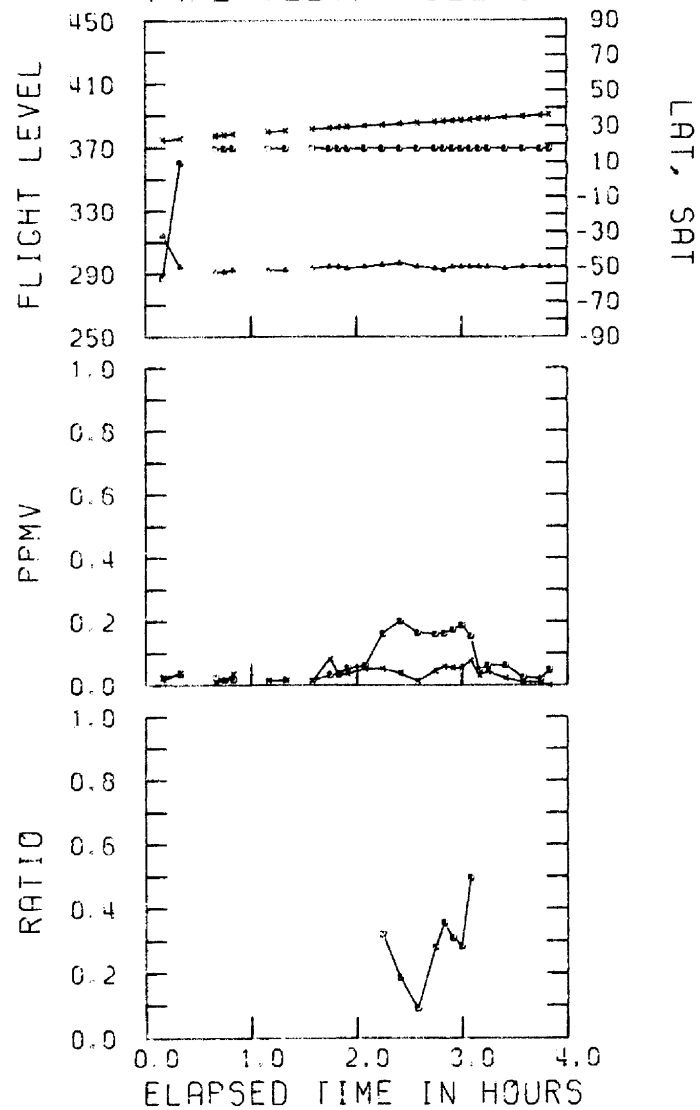


8-3

LAX TO HNL DEPARTURE 11 OCT 78
TAPE VL27, FILE 1, FLT 13

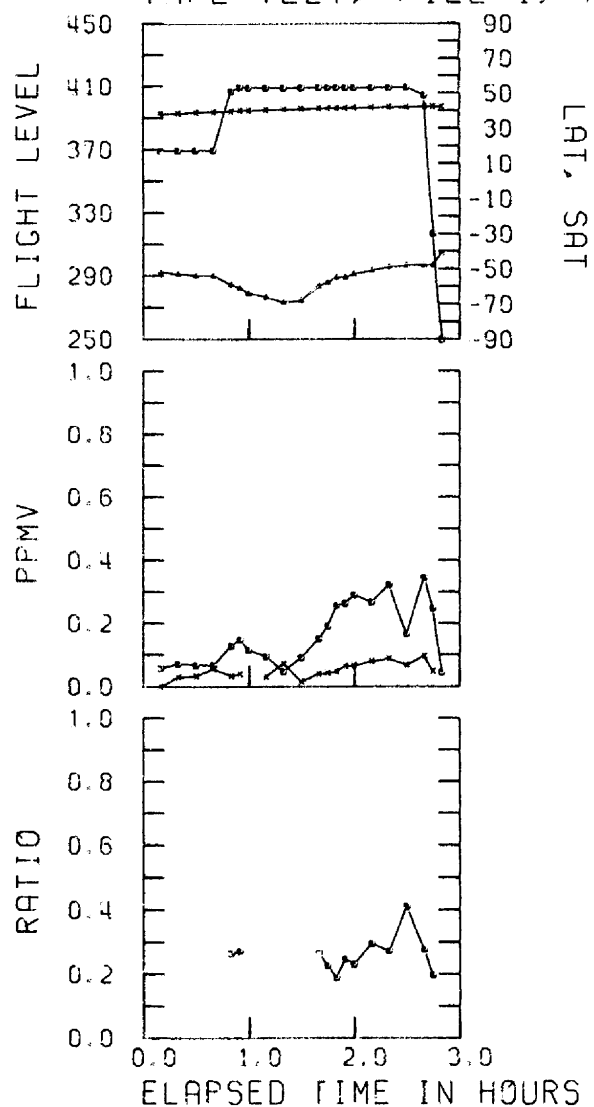


HNL TO SFO DEPARTURE 11 OCT 78
TAPE VL27, FILE 1, FLT 14

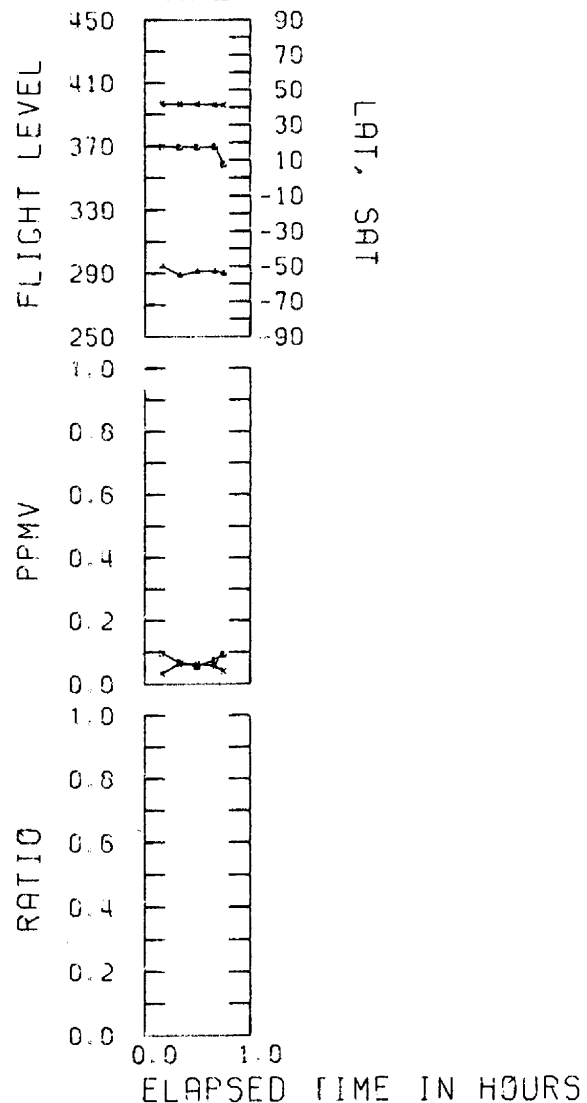


6-3

SFO TO ORD DEPARTURE 13 OCT 78
TAPE VL27, FILE 1, FLT 15

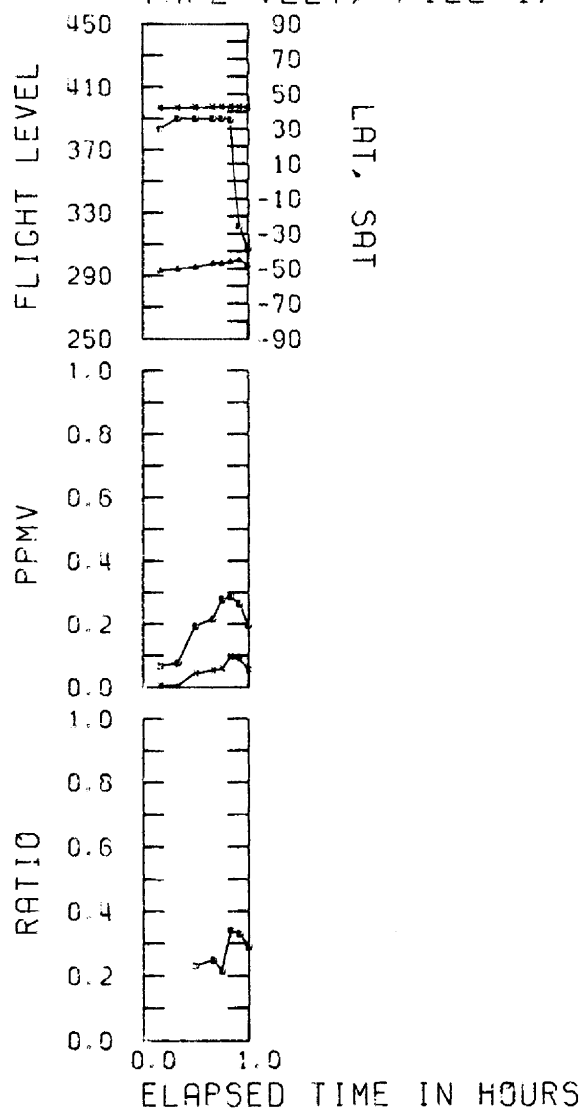


ORD TO JFK DEPARTURE 14 OCT 78
TAPE VL27, FILE 1, FLT 16

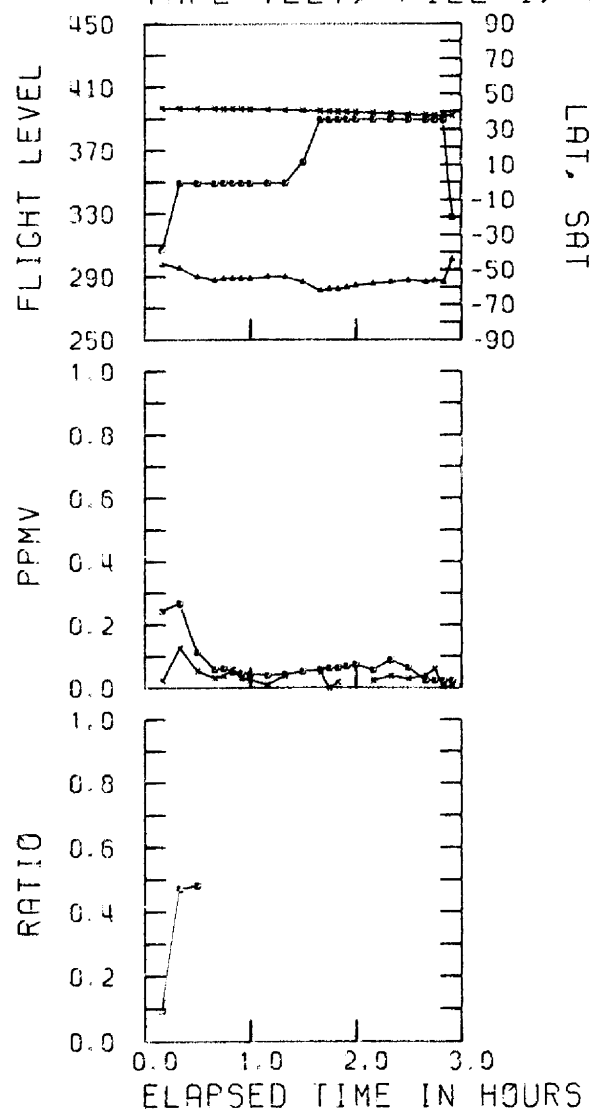


C-10

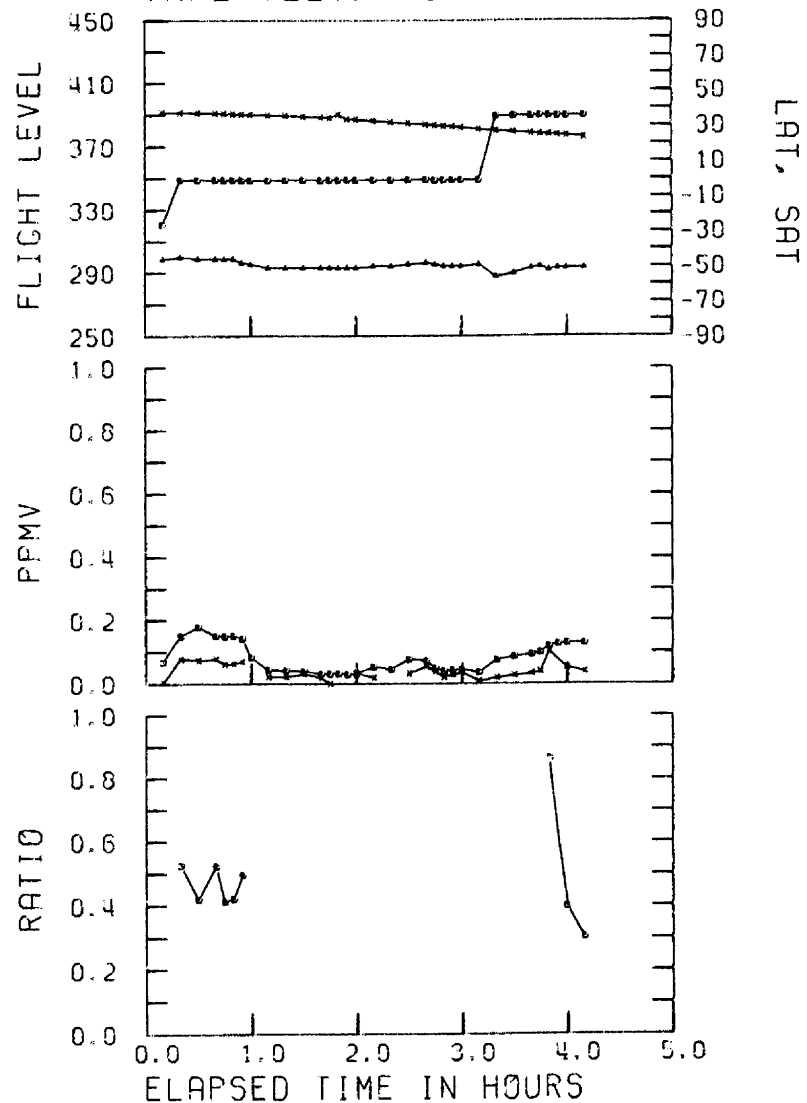
JFK TO ORD DEPARTURE 14 OCT 78
TAPE VL27, FILE 1, FLT 17



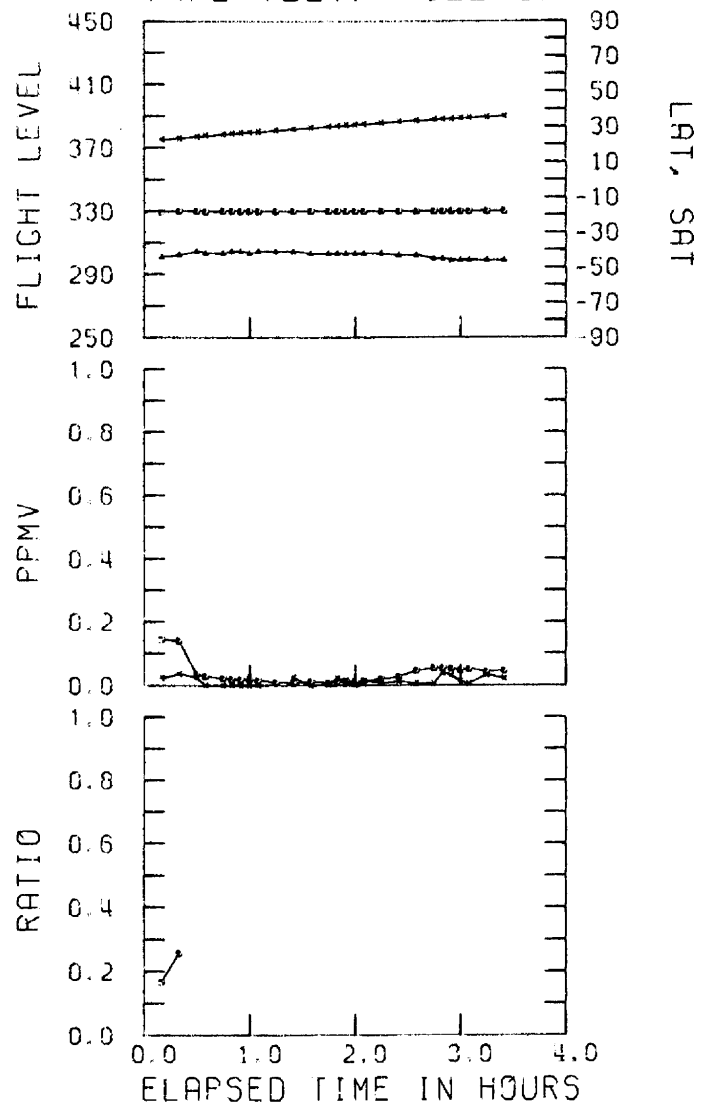
ORD TO SFO DEPARTURE 14 OCT 78
TAPE VL27, FILE 1, FLT 18



SFO TO HNL DEPARTURE 14 OCT 78
TAPE VL27, FILE 1, FLT 19

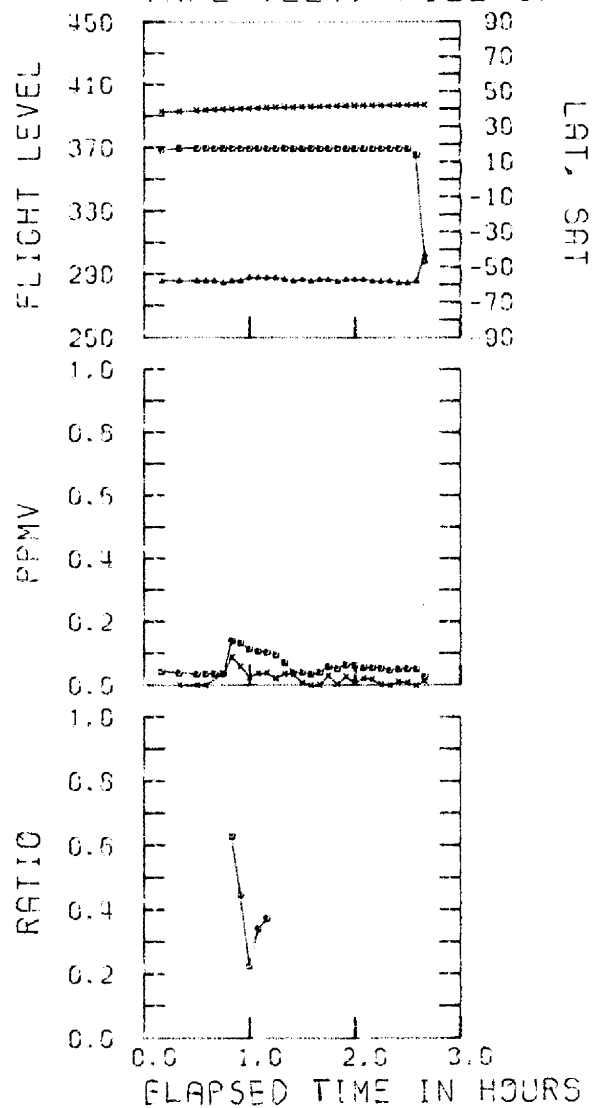


HNL TO SFO DEPARTURE 15 OCT 78
TAPE VL27, FILE 1, FLT 20

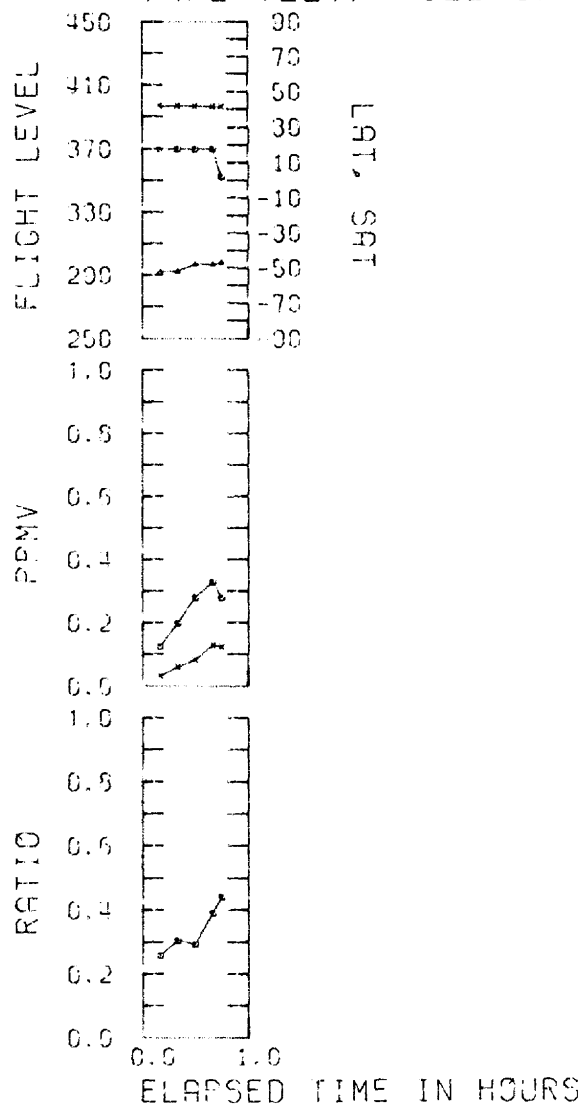


C-12

SFO TO ORD DEPARTURE 16 OCT 78
TAPE VL27, FILE 1, FLT 21

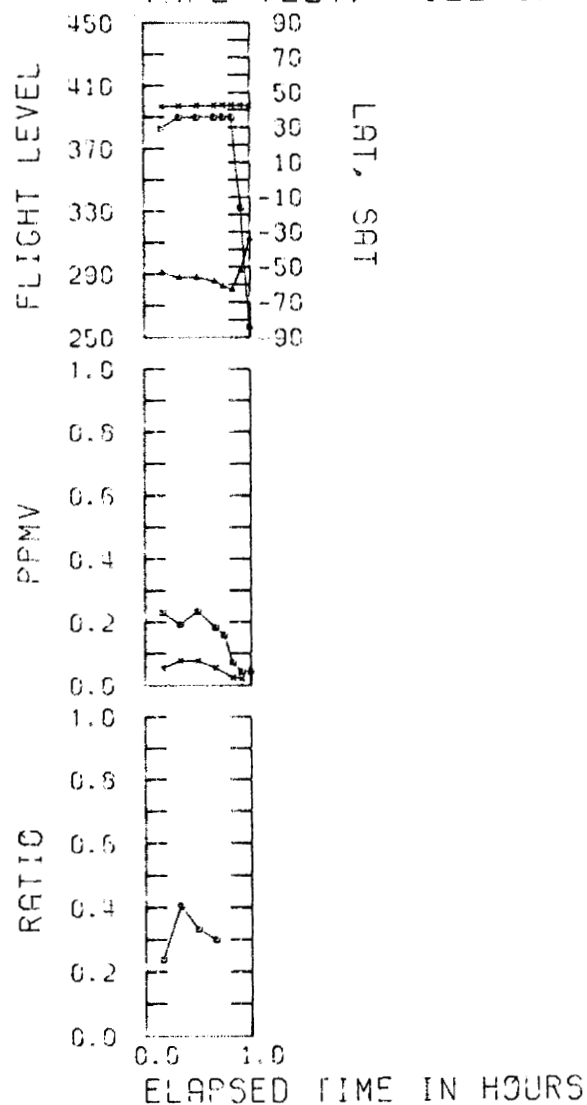


ORD TO JFK DEPARTURE 17 OCT 78
TAPE VL27, FILE 1, FLT 22

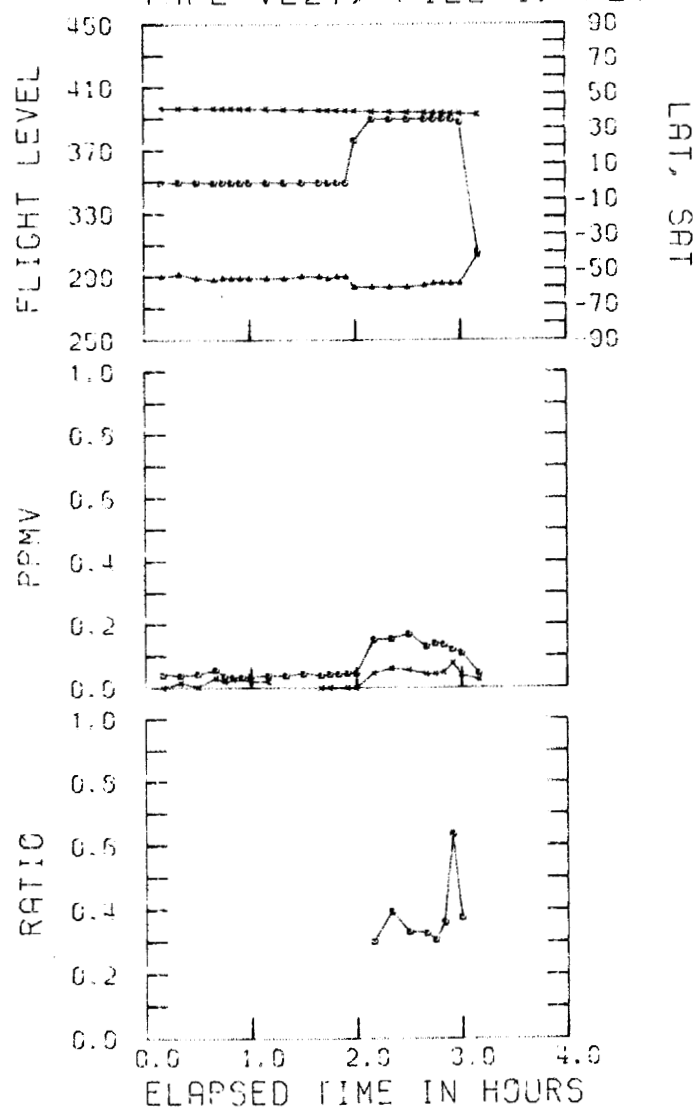


SI-3

JFK TO ORD DEPARTURE 17 OCT 78
TAPE VL27, FILE 1, FLT 23

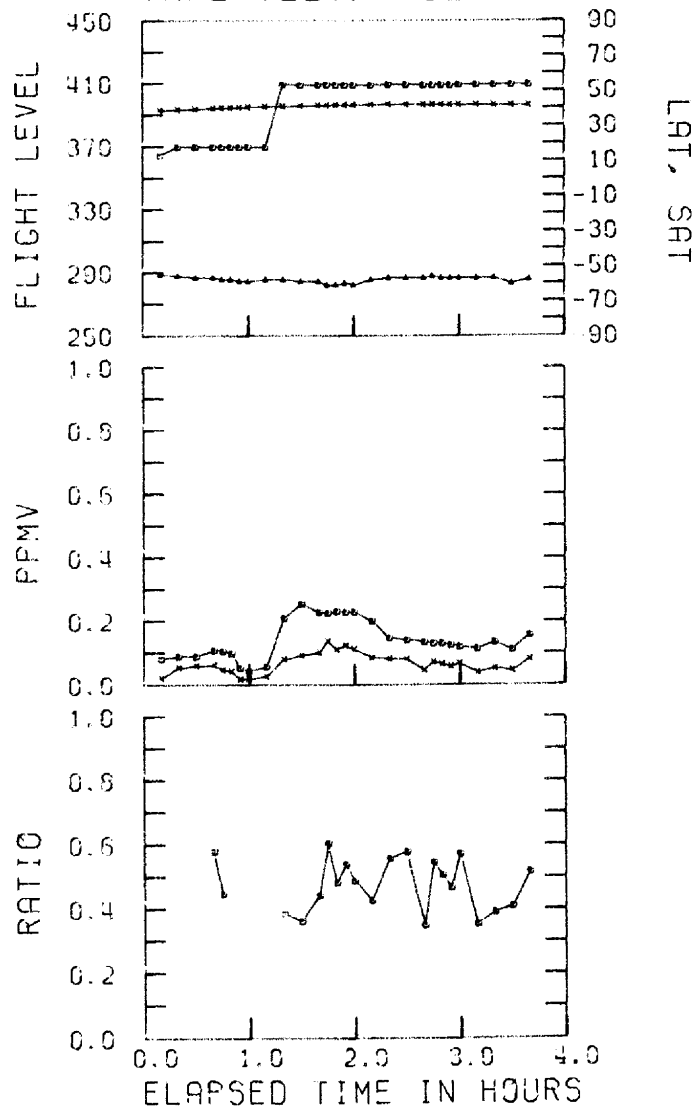


ORD TO SFO DEPARTURE 17 OCT 78
TAPE VL27, FILE 1, FLT 24

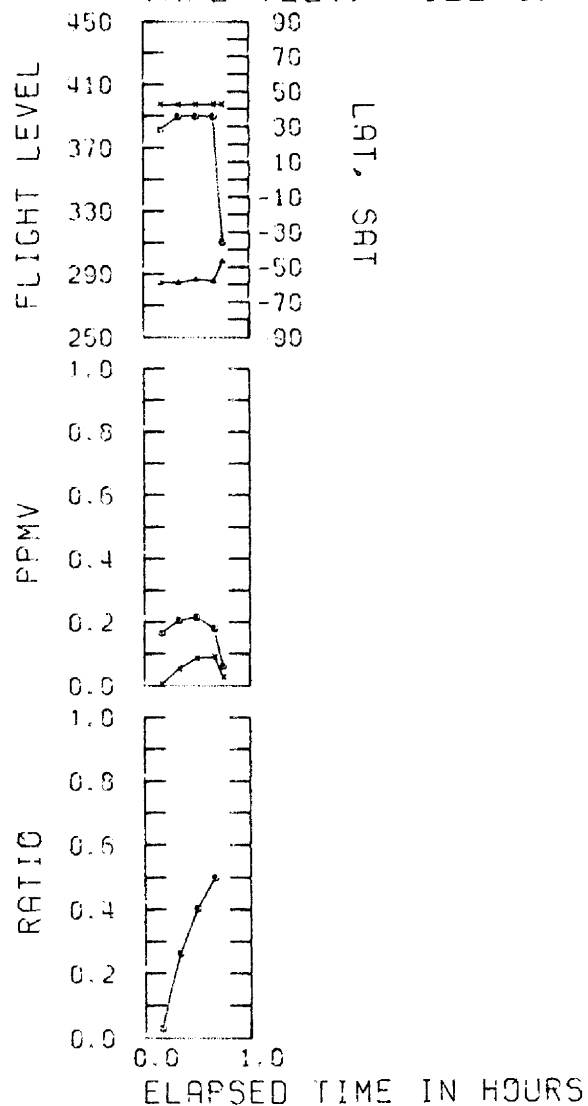


C-14

SFO TO JFK DEPARTURE 17 OCT 78
TAPE VL27, FILE 1, FLT 25

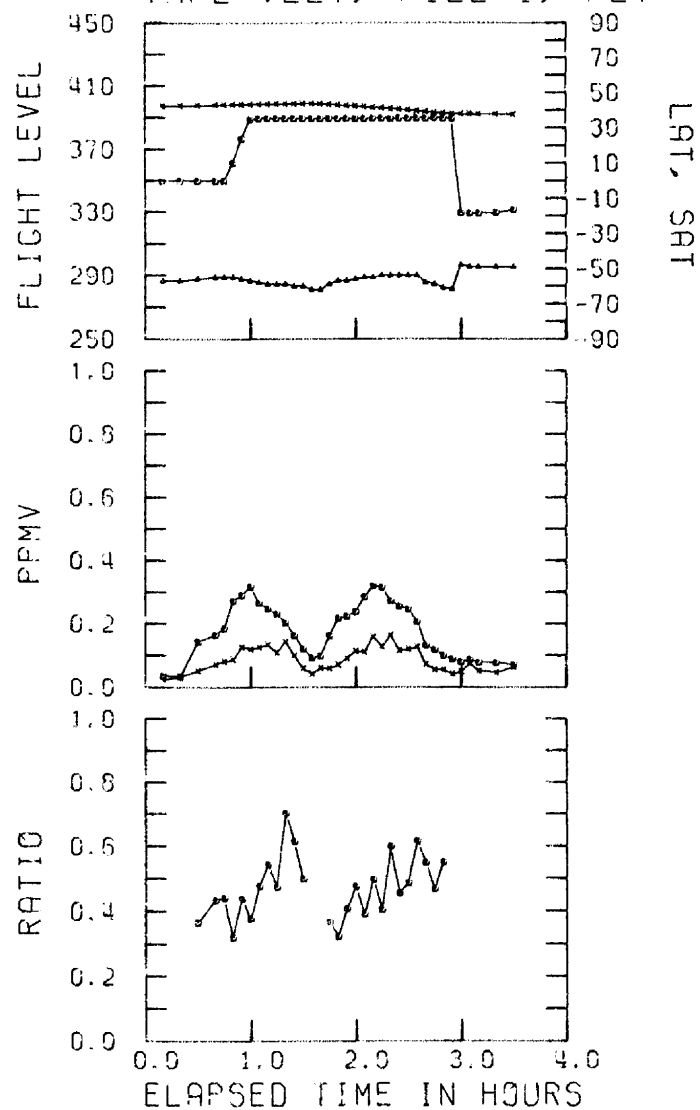


JFK TO ORD DEPARTURE 18 OCT 78
TAPE VL27, FILE 1, FLT 26

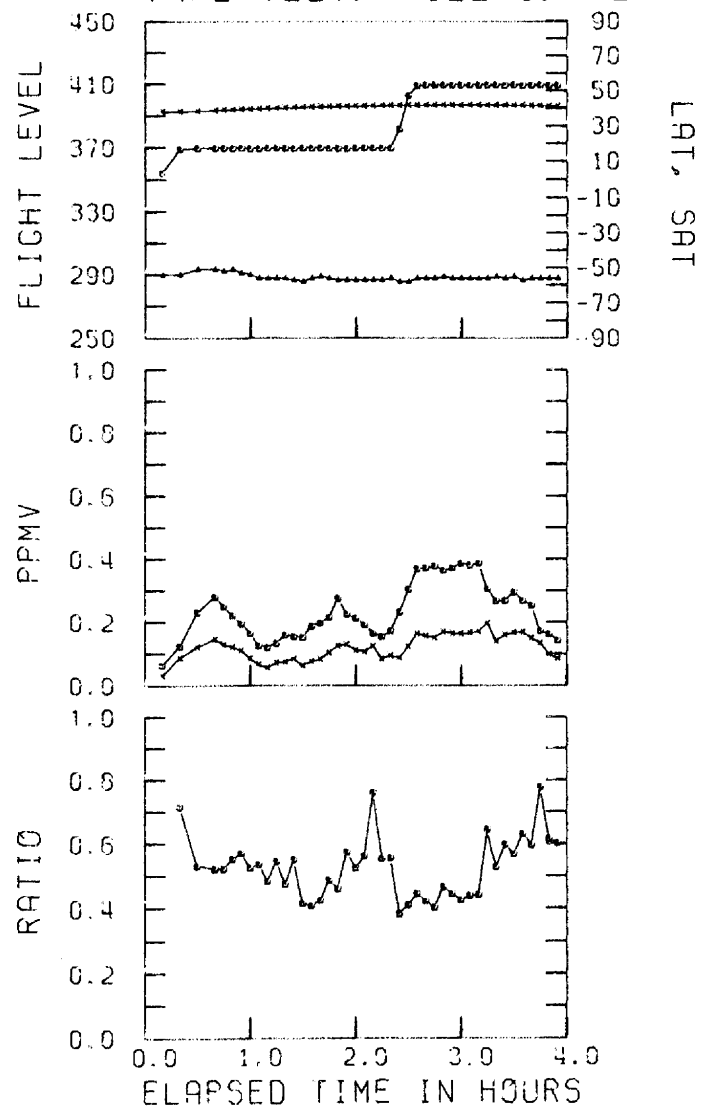


C-15

ORD TO SFO DEPARTURE 18 OCT 78
TAPE VL27, FILE 1, FLT 27

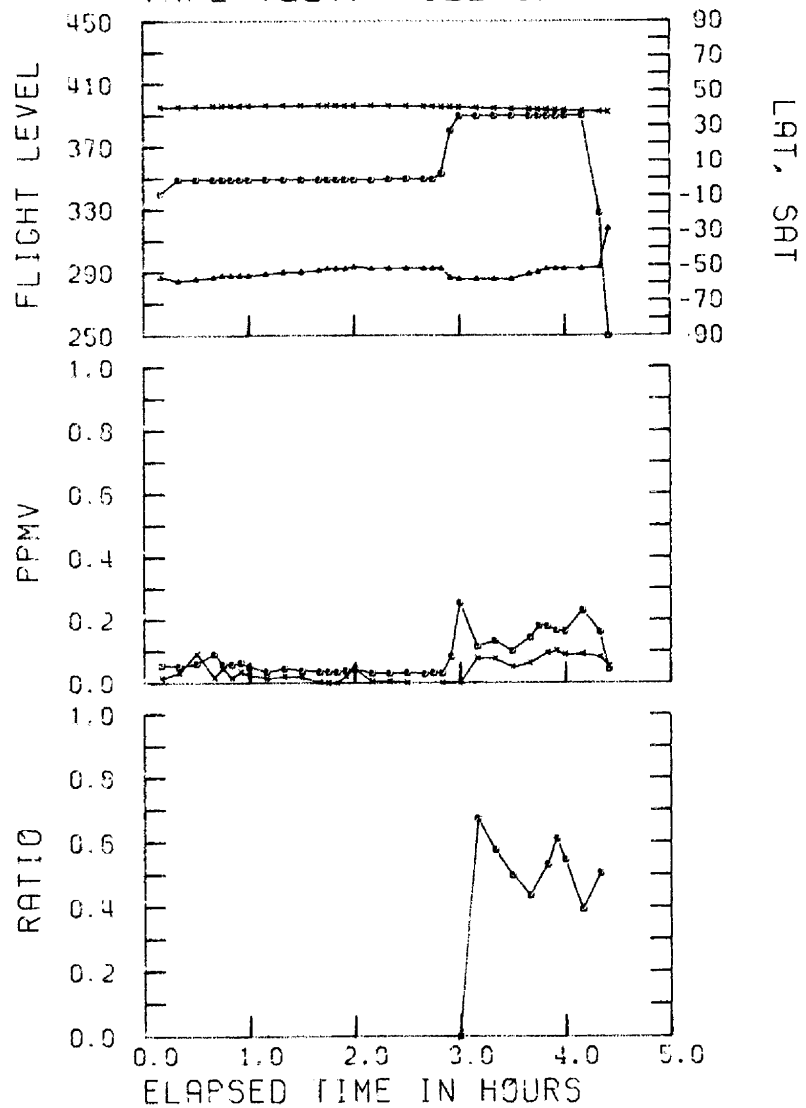


SFO TO JFK DEPARTURE 18 OCT 78
TAPE VL27, FILE 1, FLT 28

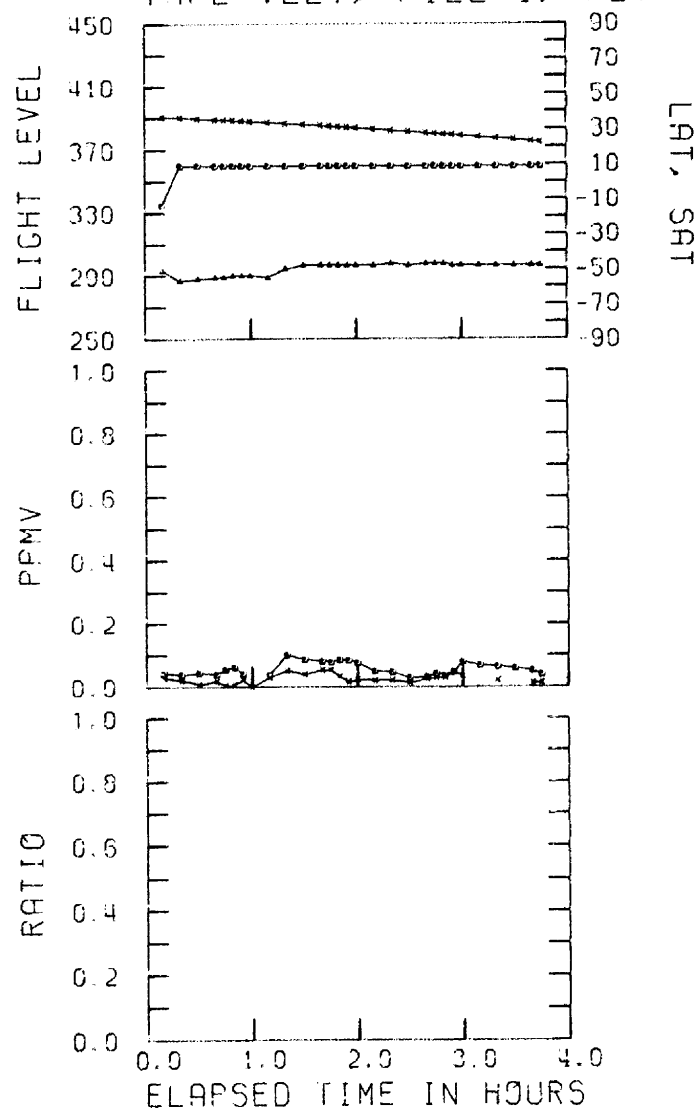


C-16

JFK TO SFO DEPARTURE 19 OCT 78
TAPE VL27, FILE 1, FLT 29

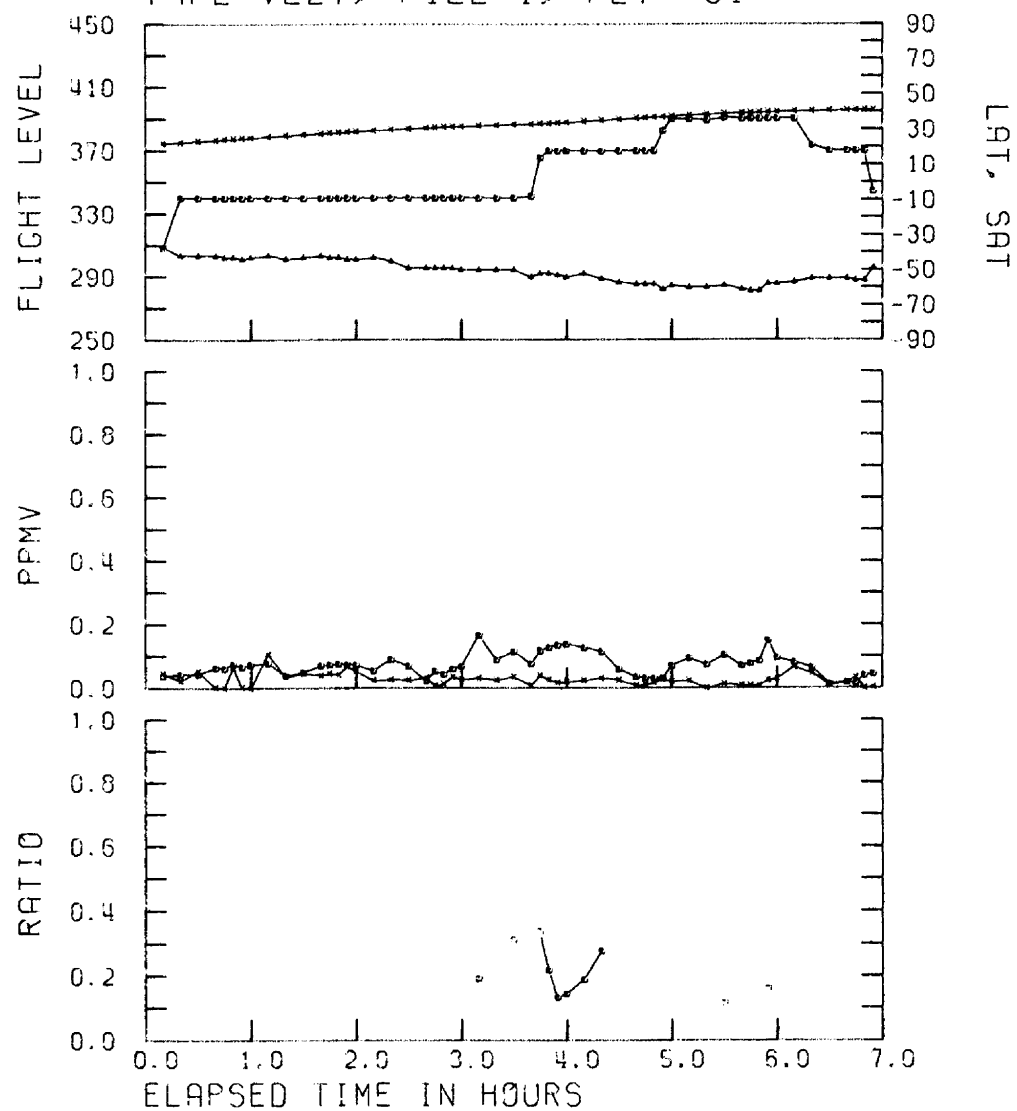


SFO TO HNL DEPARTURE 19 OCT 78
TAPE VL27, FILE 1, FLT 30

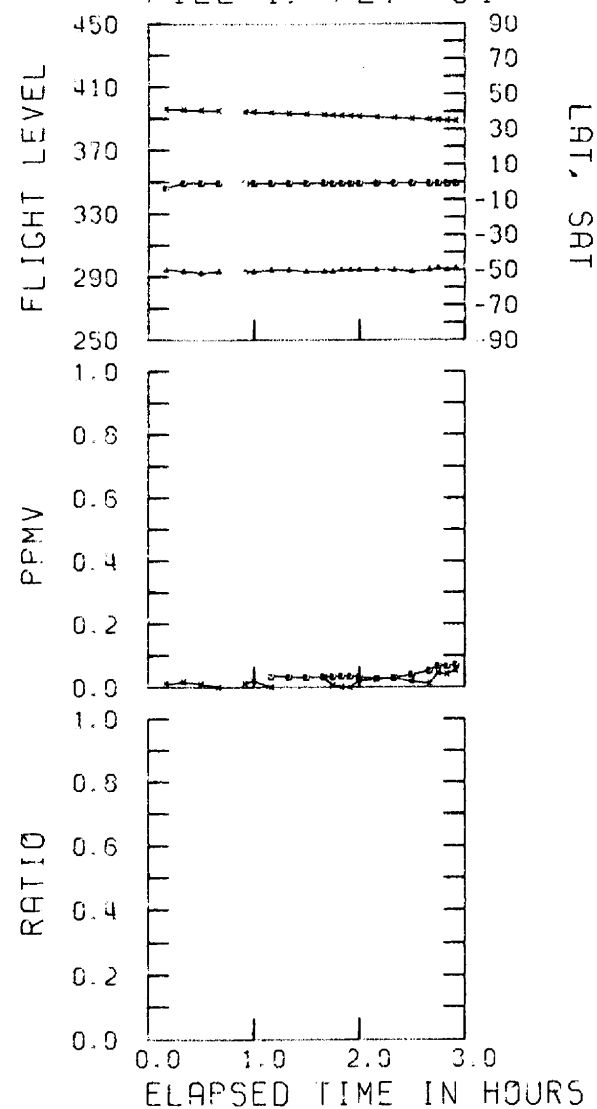


C-17

HNL TO ORD DEPARTURE 20 OCT 78
TAPE VL27, FILE 1, FLT 31

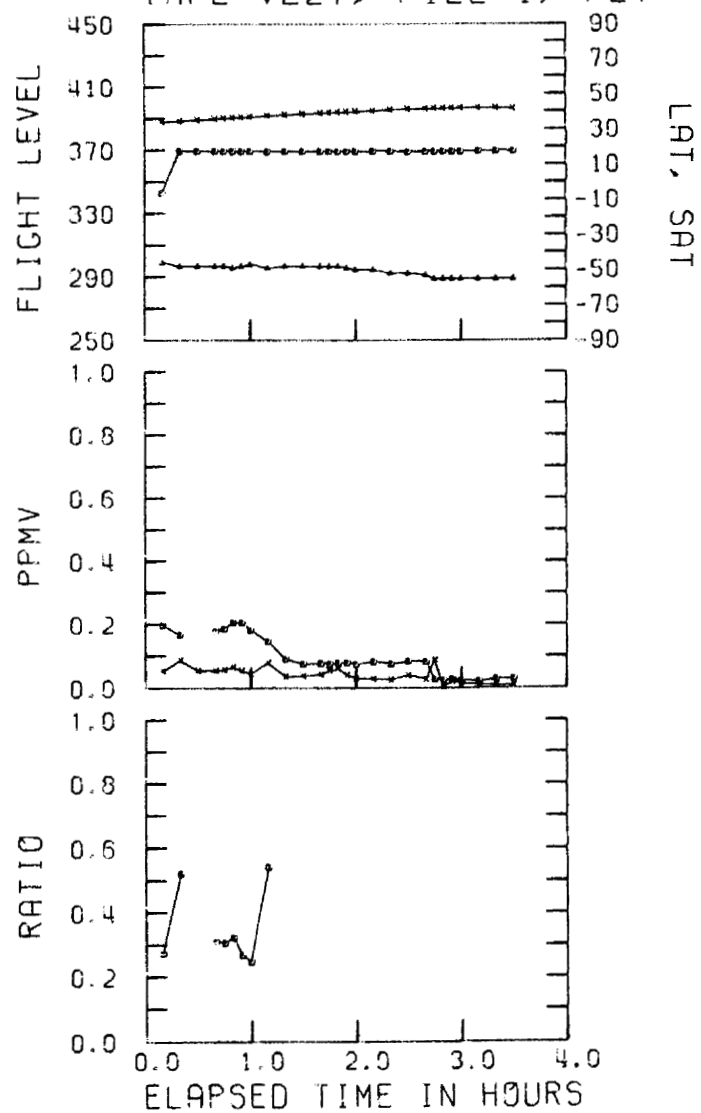


ORD TO LAX
DEPARTURE 20 OCT 78
TAPE VL27,
FILE 1, FLT 34

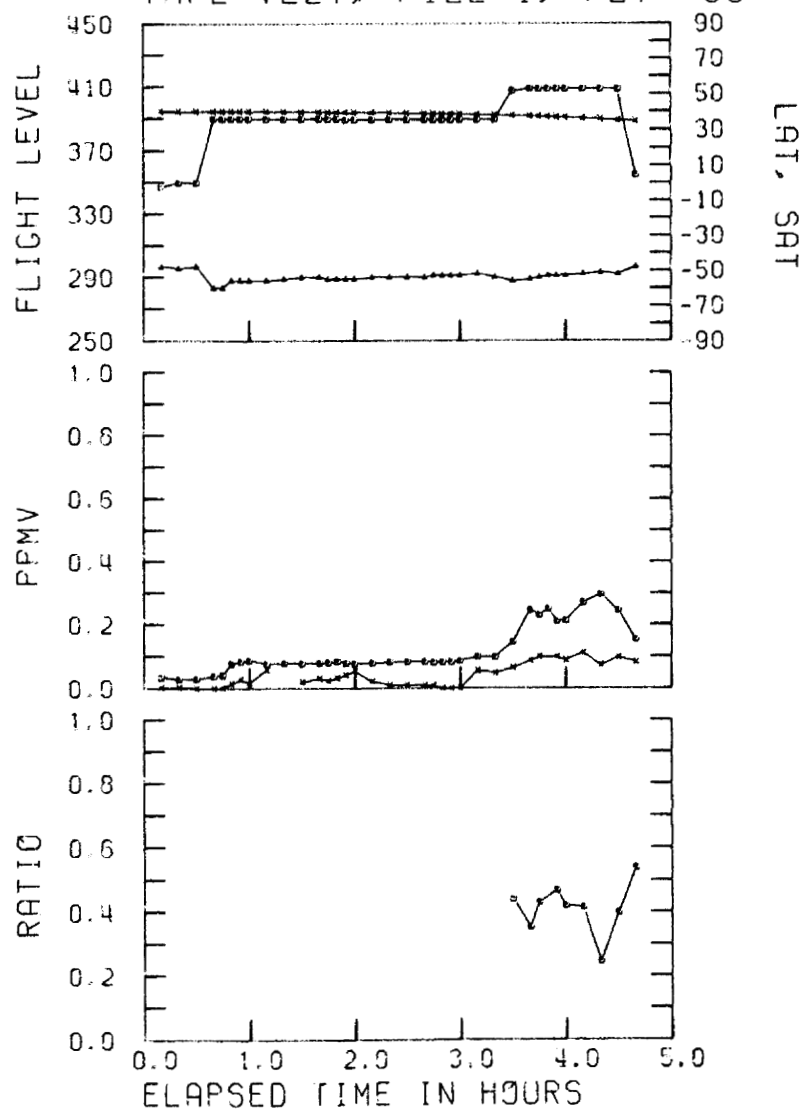


81-3

LAX TO JFK DEPARTURE 22 OCT 78
TAPE VL27, FILE 1, FLT 35

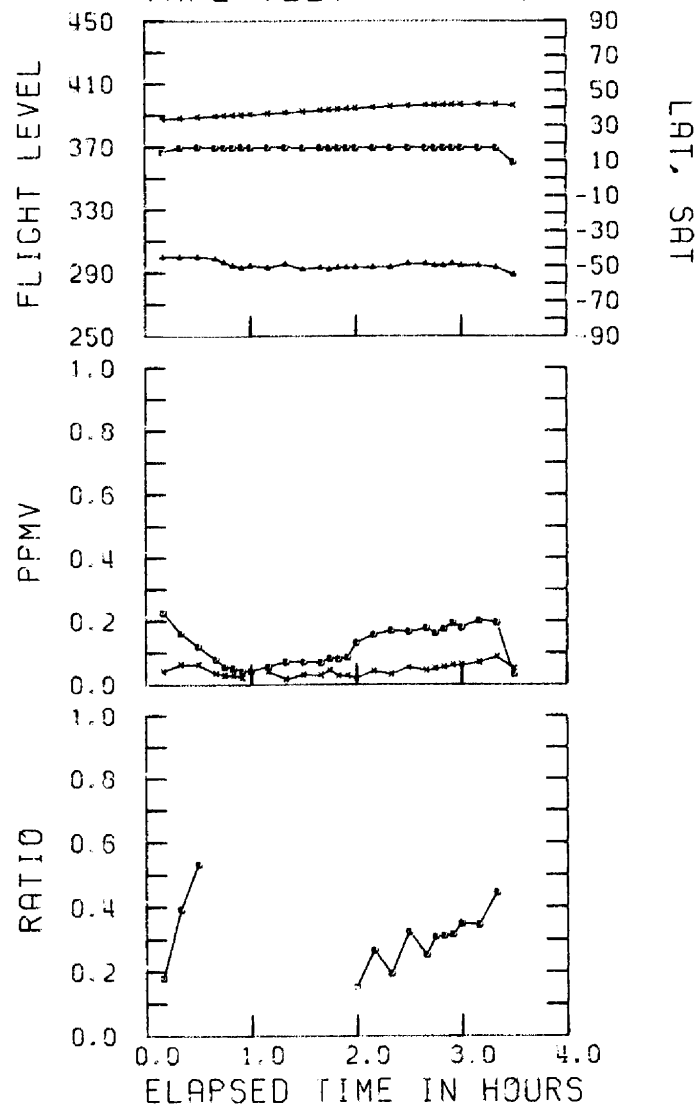


JFK TO LAX DEPARTURE 23 OCT 78
TAPE VL27, FILE 1, FLT 36

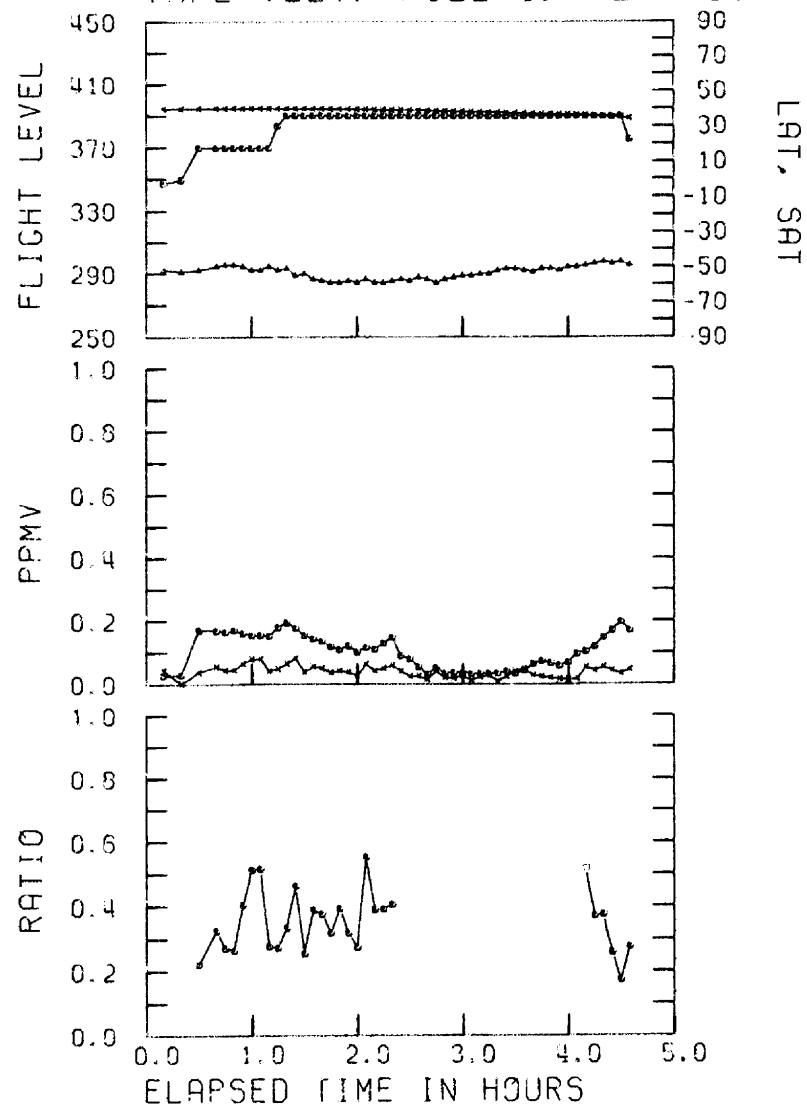


C-19

LAX TO JFK DEPARTURE 23 OCT 78
TAPE VL27, FILE 1, FLT 37

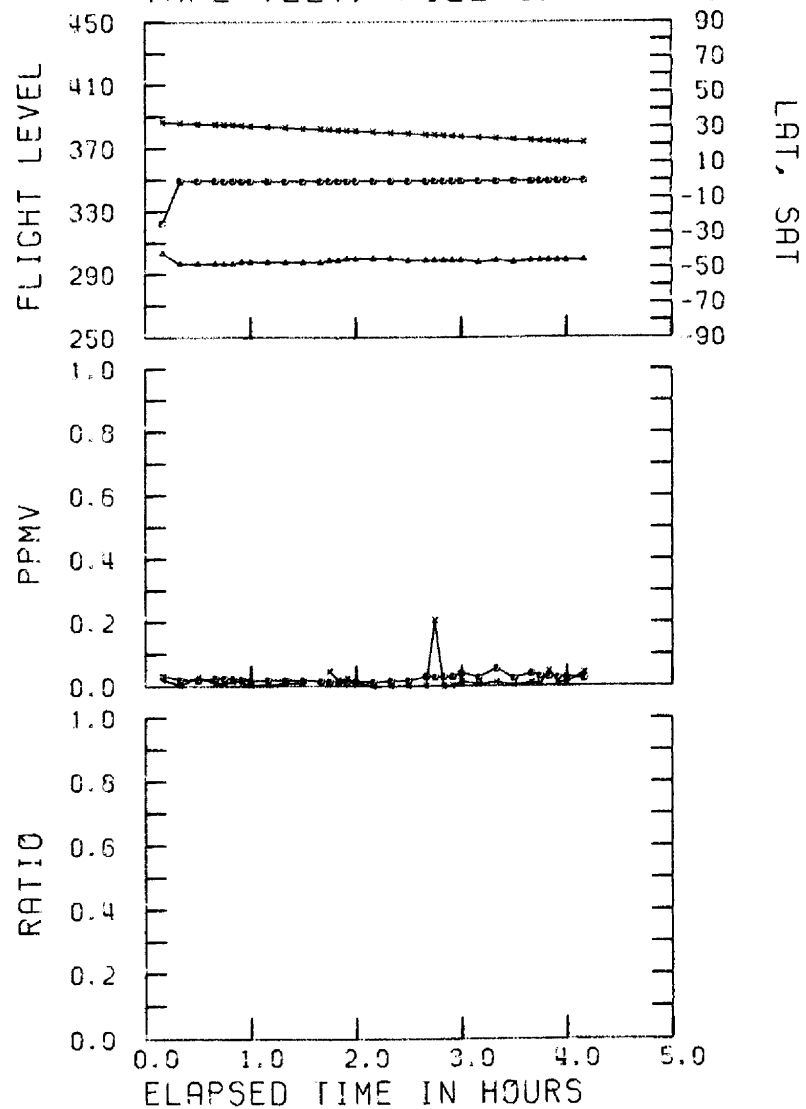


JFK TO LAX DEPARTURE 24 OCT 78
TAPE VL27, FILE 1, FLT 38

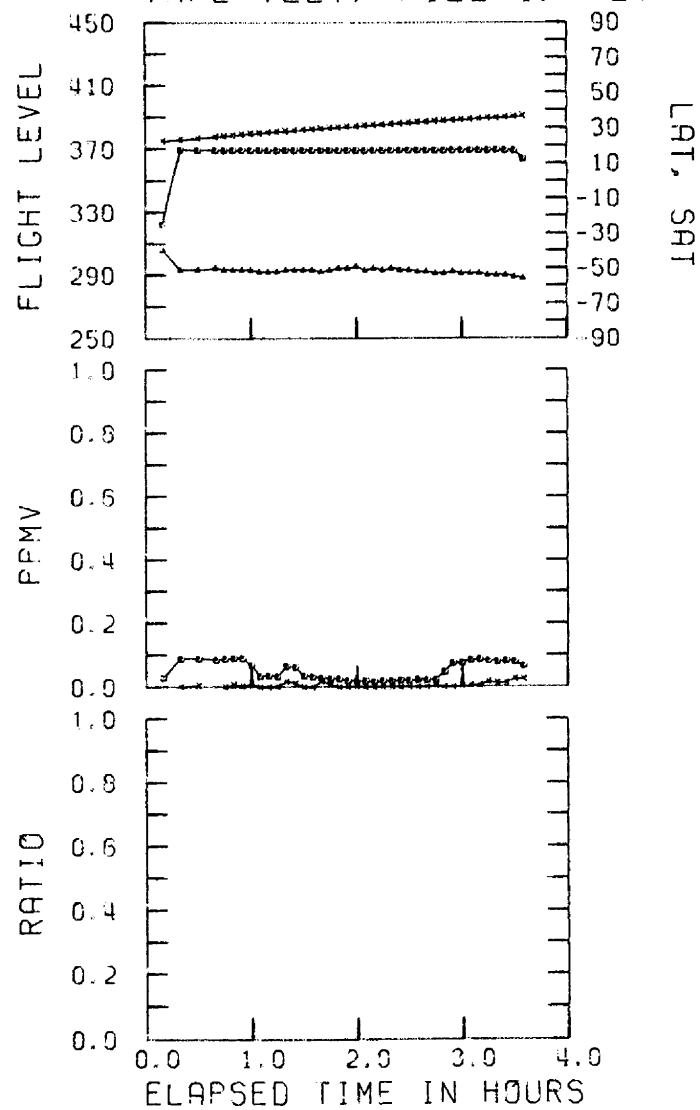


C-20

LAX TO HNL DEPARTURE 24 OCT 78
TAPE VL27, FILE 1, FLT 39

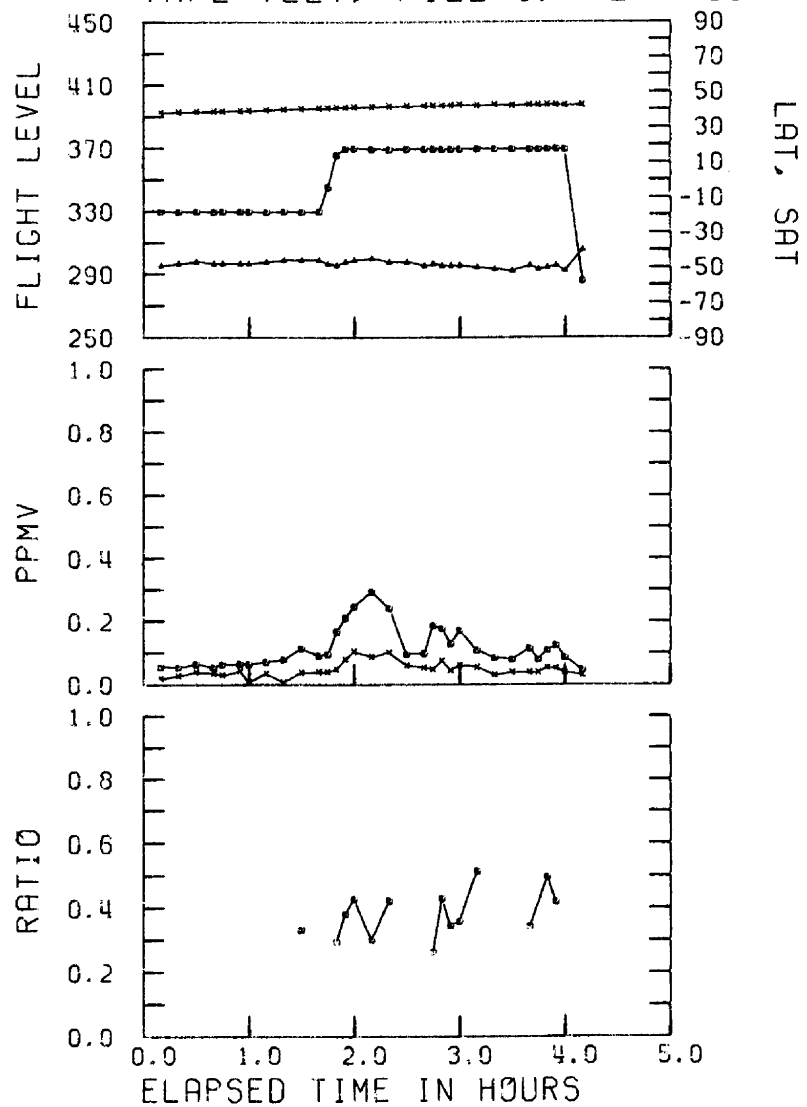


HNL TO SFO DEPARTURE 24 OCT 78
TAPE VL27, FILE 1, FLT 40

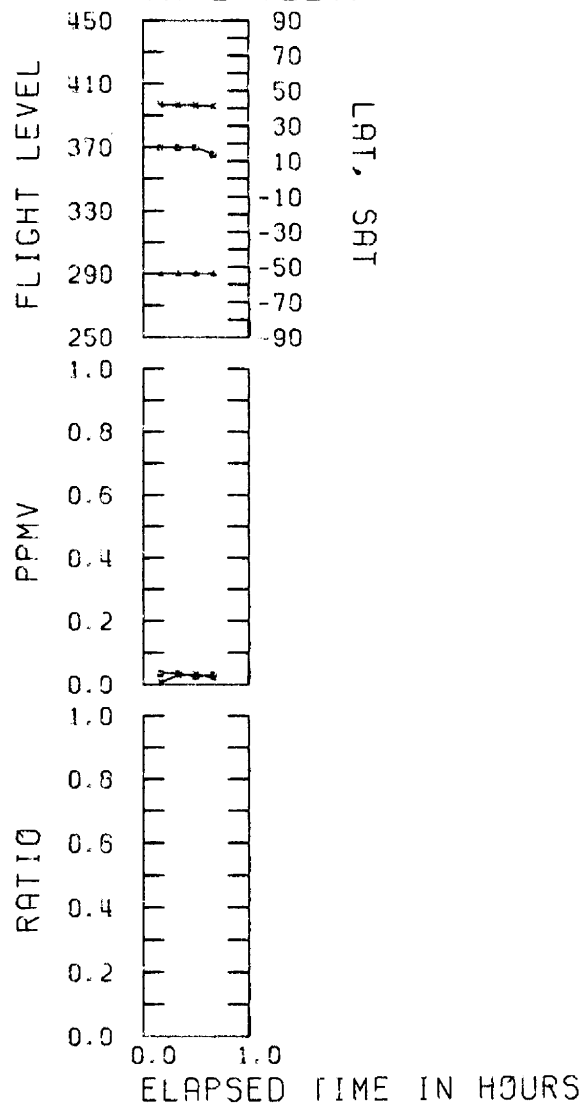


C-21

SFO TO ORD DEPARTURE 25 OCT 78
TAPE VL27, FILE 1, FLT 41

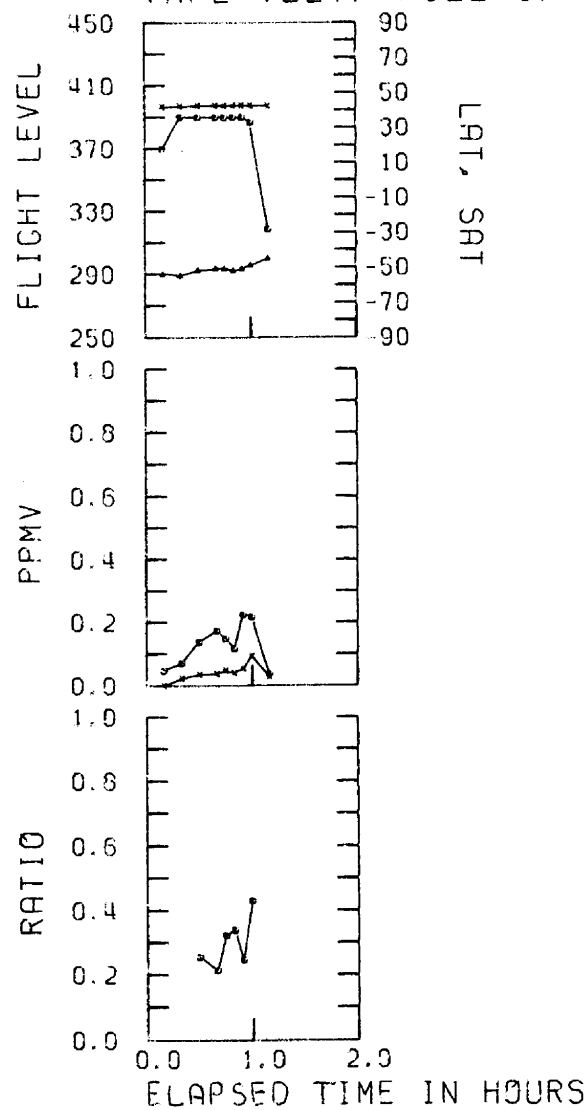


ORD TO JFK DEPARTURE 26 OCT 78
TAPE VL27, FILE 1, FLT 42

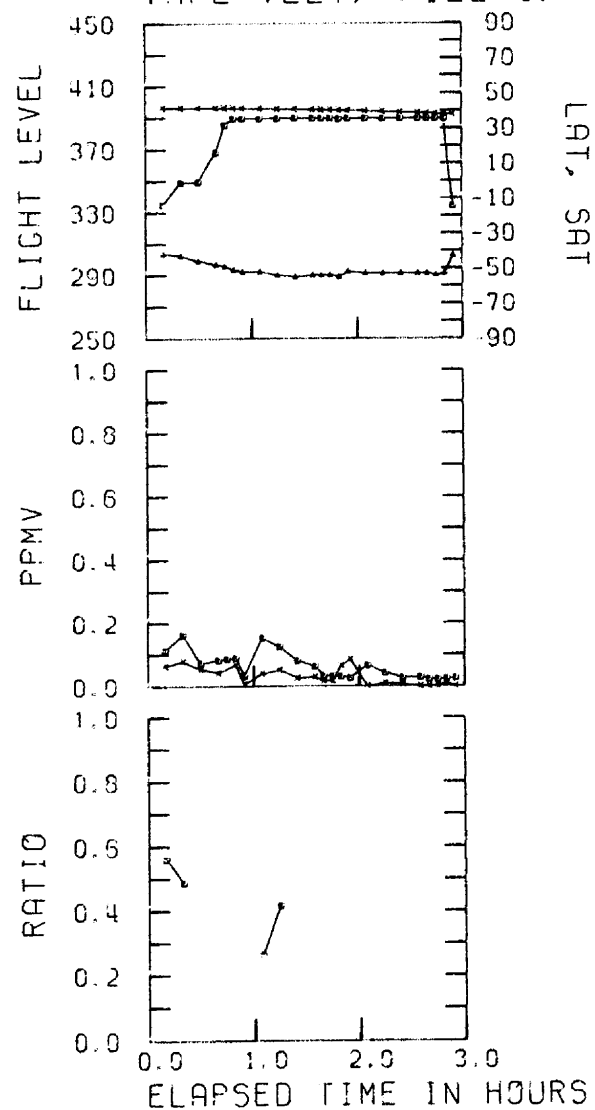


C-22

JFK TO ORD DEPARTURE 26 OCT 78
TAPE VL27, FILE 1, FLT 43

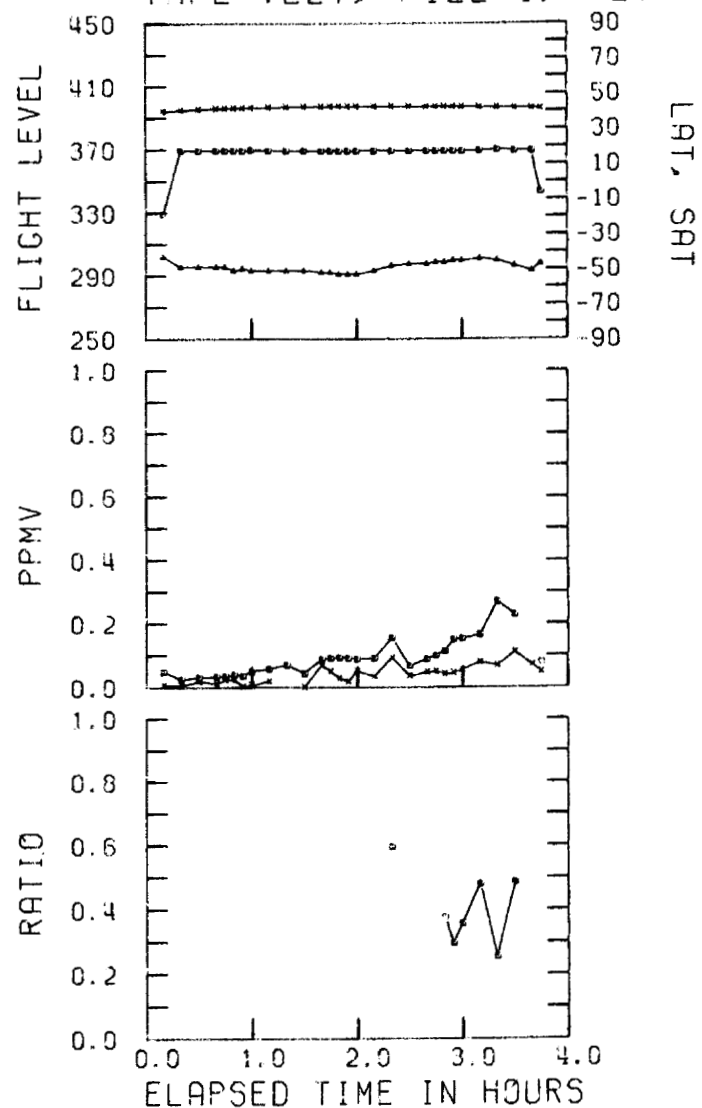


ORD TO SFO DEPARTURE 26 OCT 78
TAPE VL27, FILE 1, FLT 44

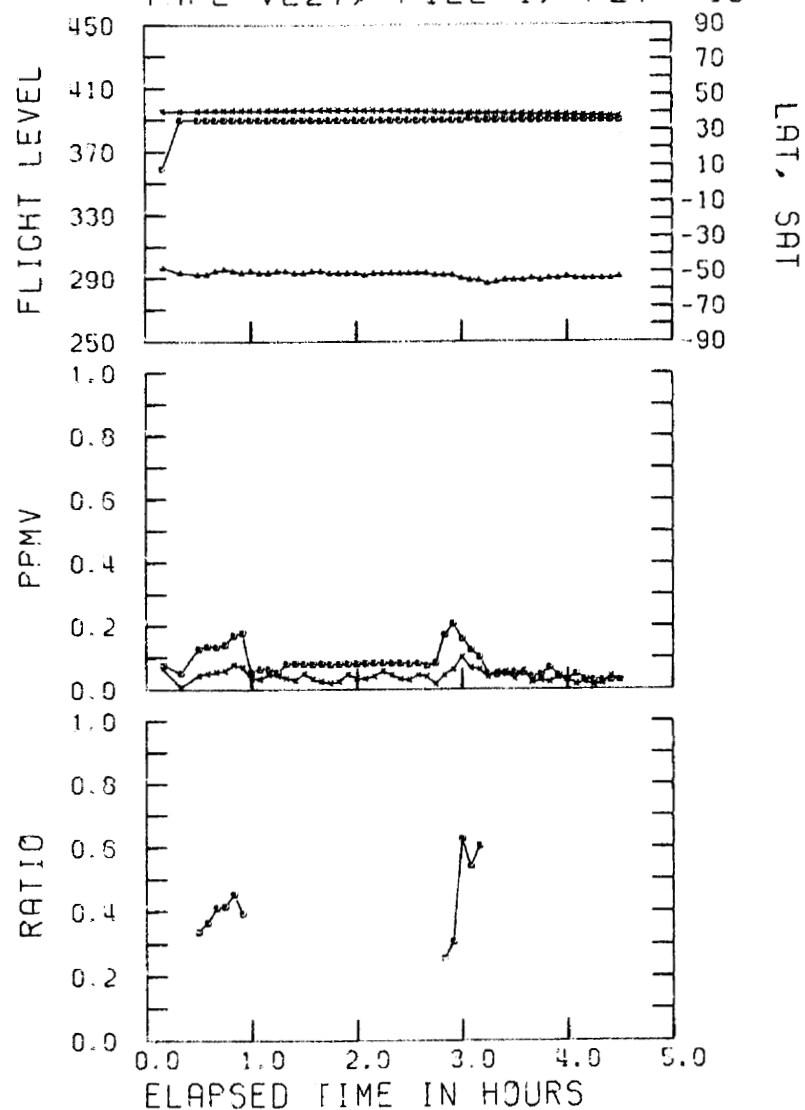


C-23

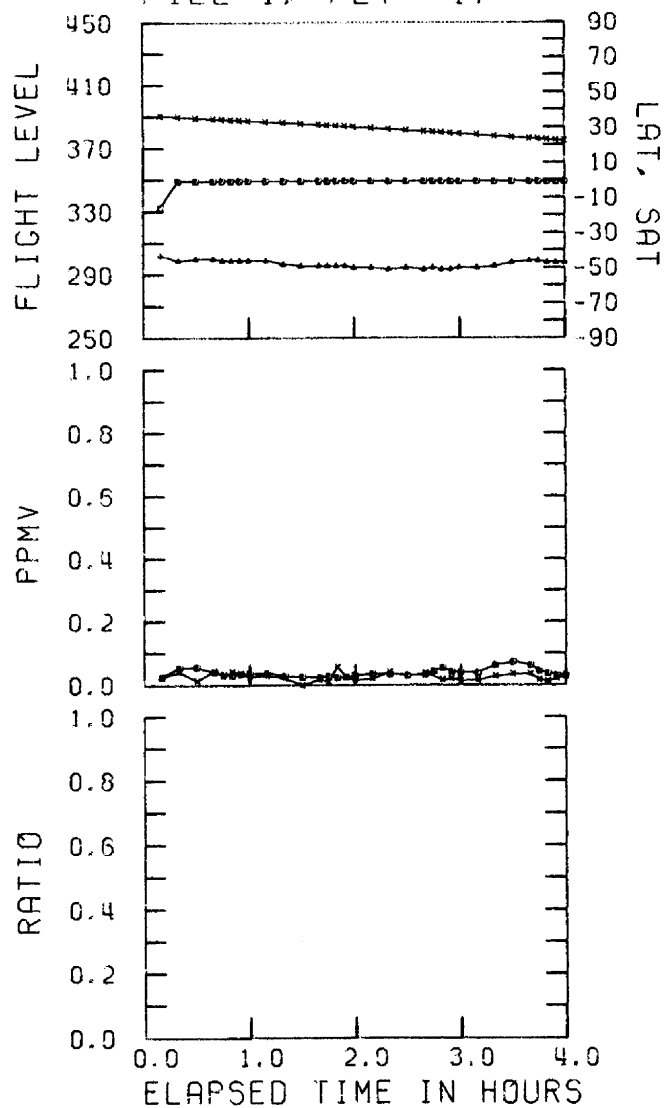
SFO TO JFK DEPARTURE 26 OCT 78
TAPE VL27, FILE 1, FLT 45



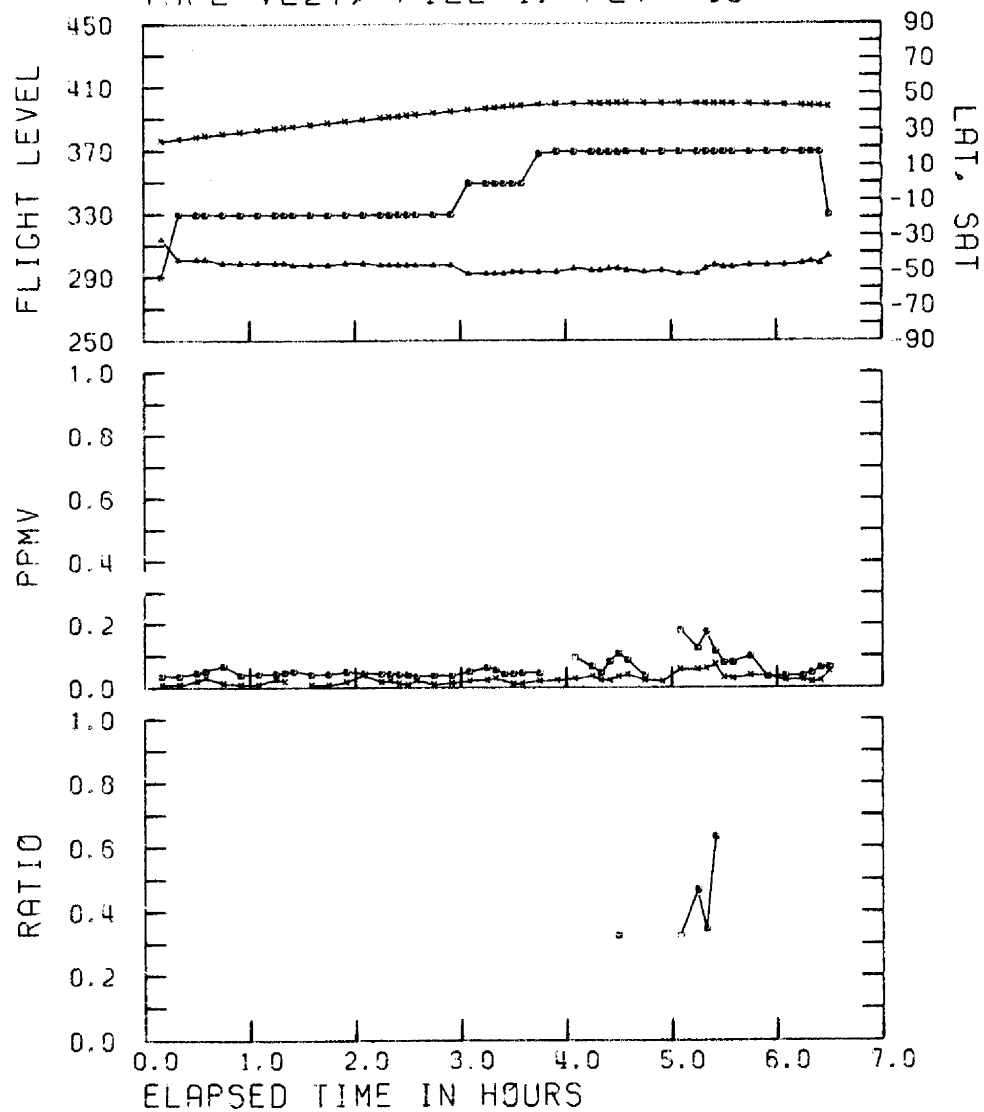
JFK TO SFO DEPARTURE 27 OCT 78
TAPE VL27, FILE 1, FLT 46



SFO TO HNL
DEPARTURE 27 OCT 78
TAPE VL27,
FILE 1, FLT 47

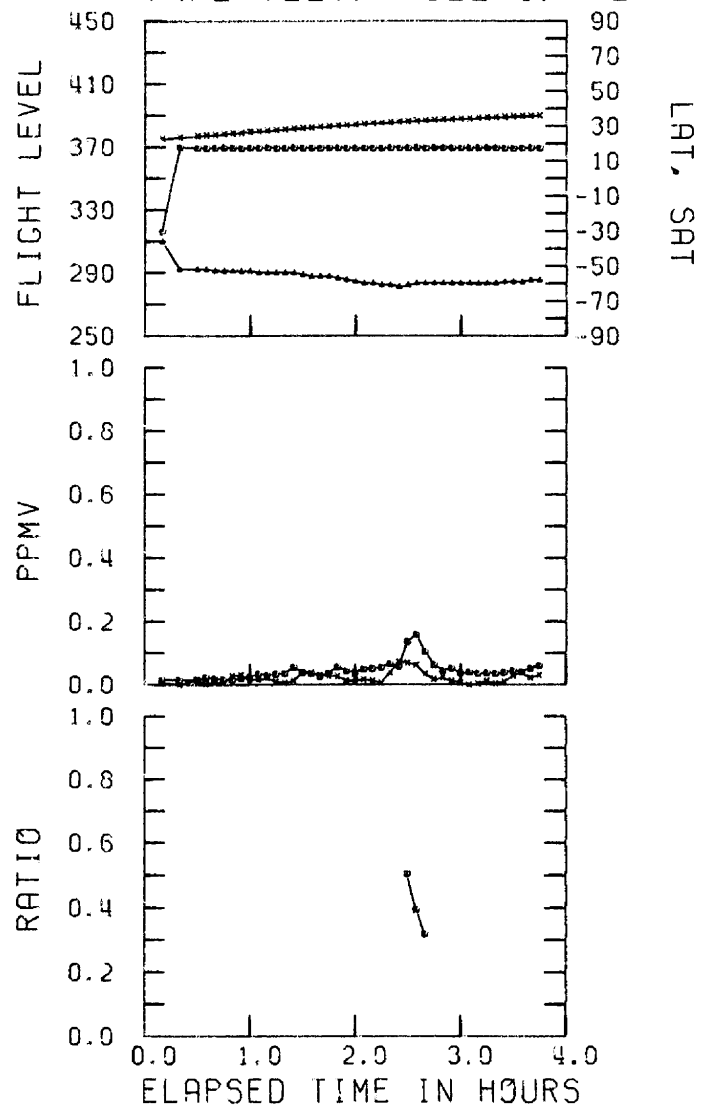


HNL TO ORD DEPARTURE 28 OCT 78
TAPE VL27, FILE 1, FLT 48

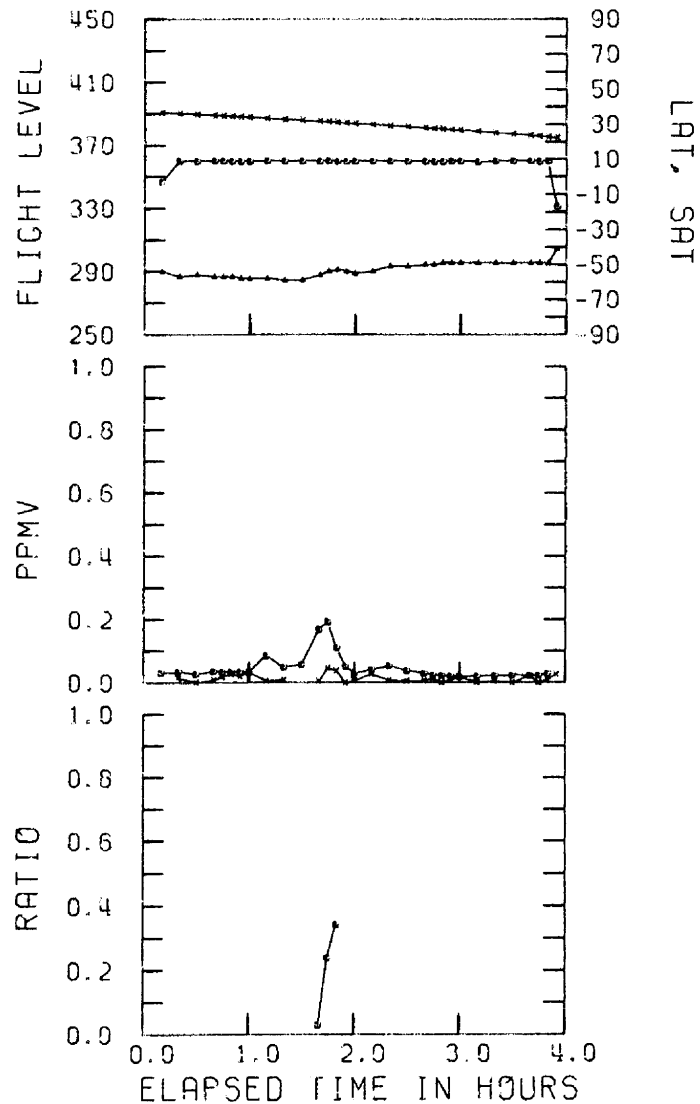


C-25

HNL TO SFO DEPARTURE 30 OCT 78
TAPE VL27, FILE 1, FLT 49

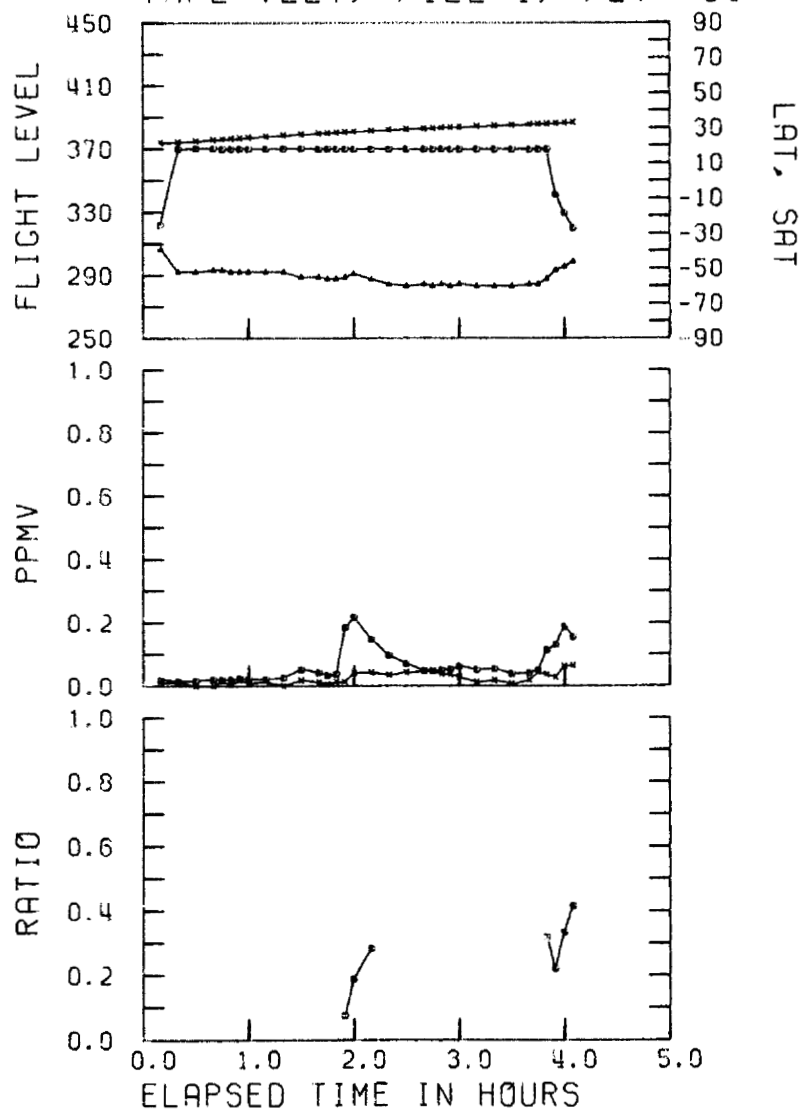


SFO TO HNL DEPARTURE 31 OCT 78
TAPE VL27, FILE 1, FLT 50

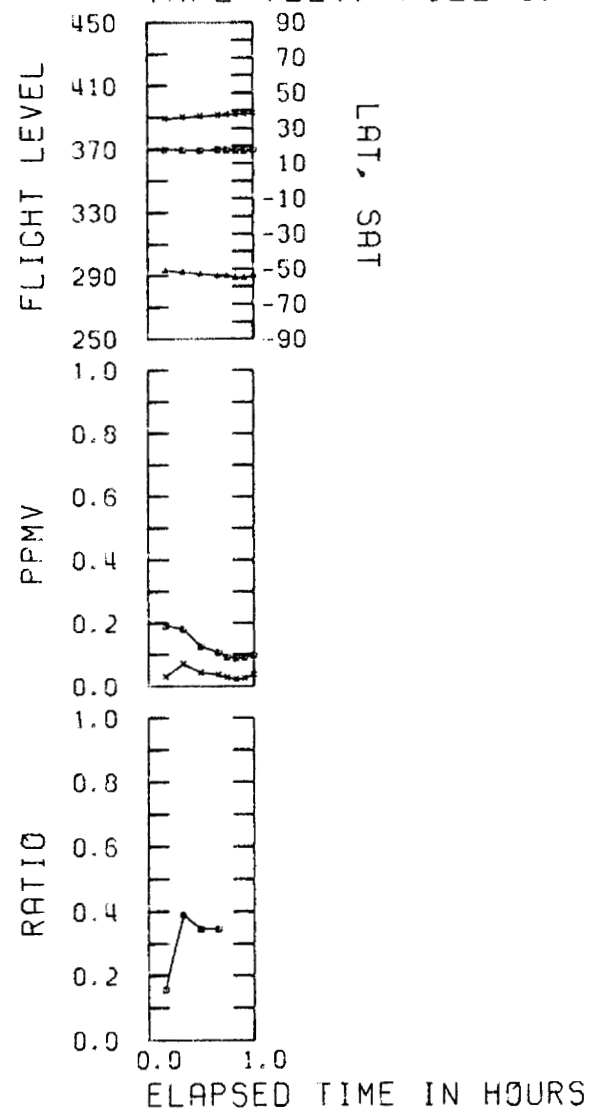


C-26

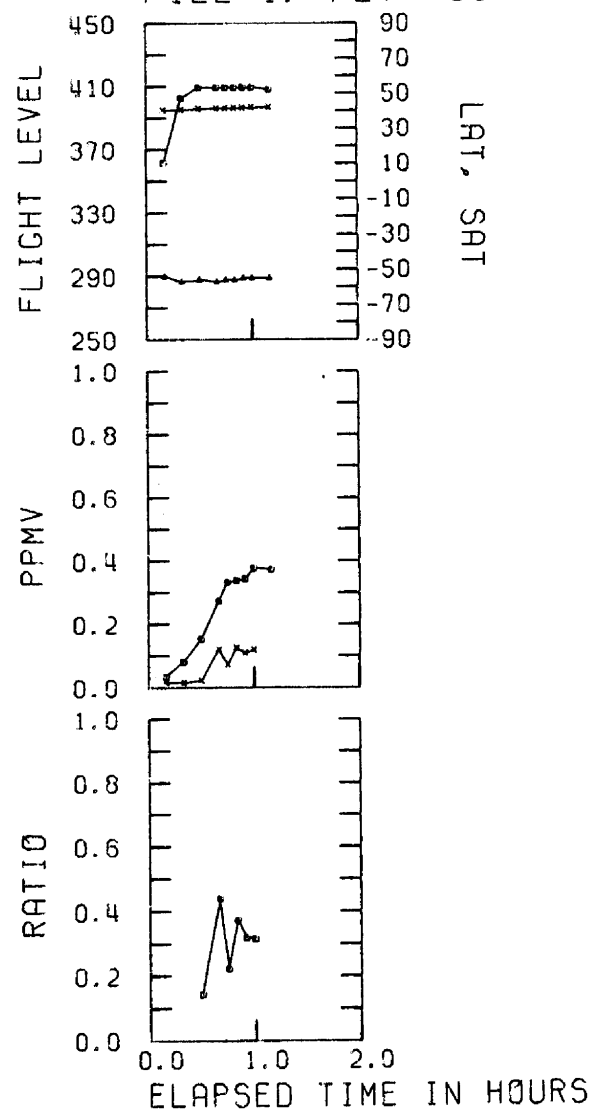
HNL TO LAX DEPARTURE 31 OCT 78
TAPE VL27, FILE 1, FLT 51



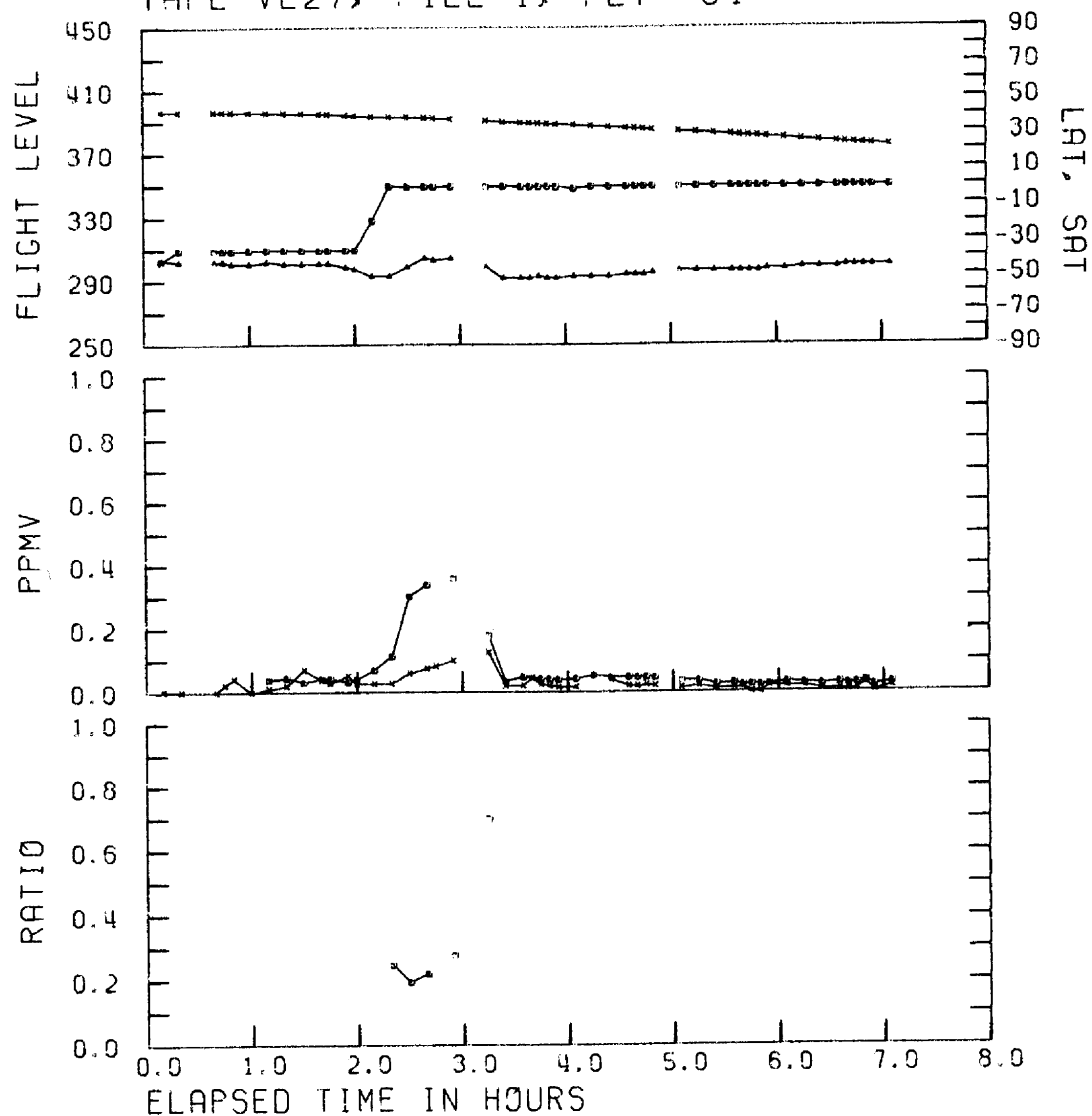
LAX TO DEN DEPARTURE 1 NOV 78
TAPE VL27, FILE 1, FLT 52



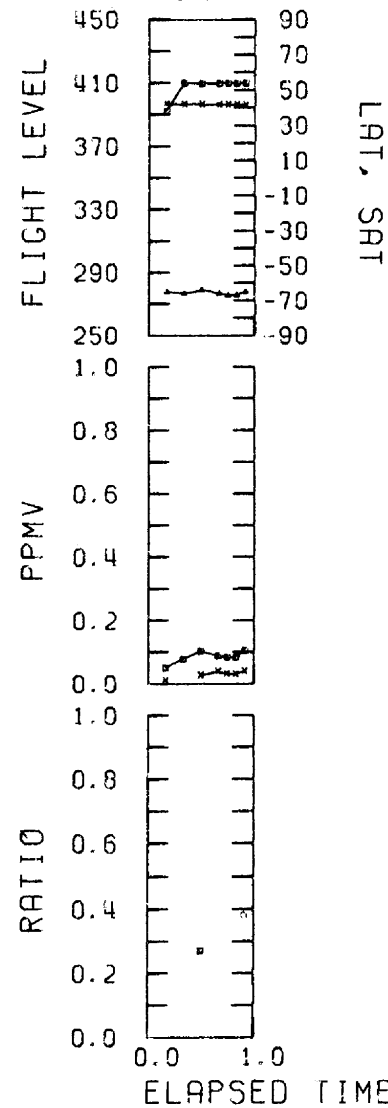
DEN TO ORD
DEPARTURE
1 NOV 78
TAPE VL27,
FILE 1, FLT 53



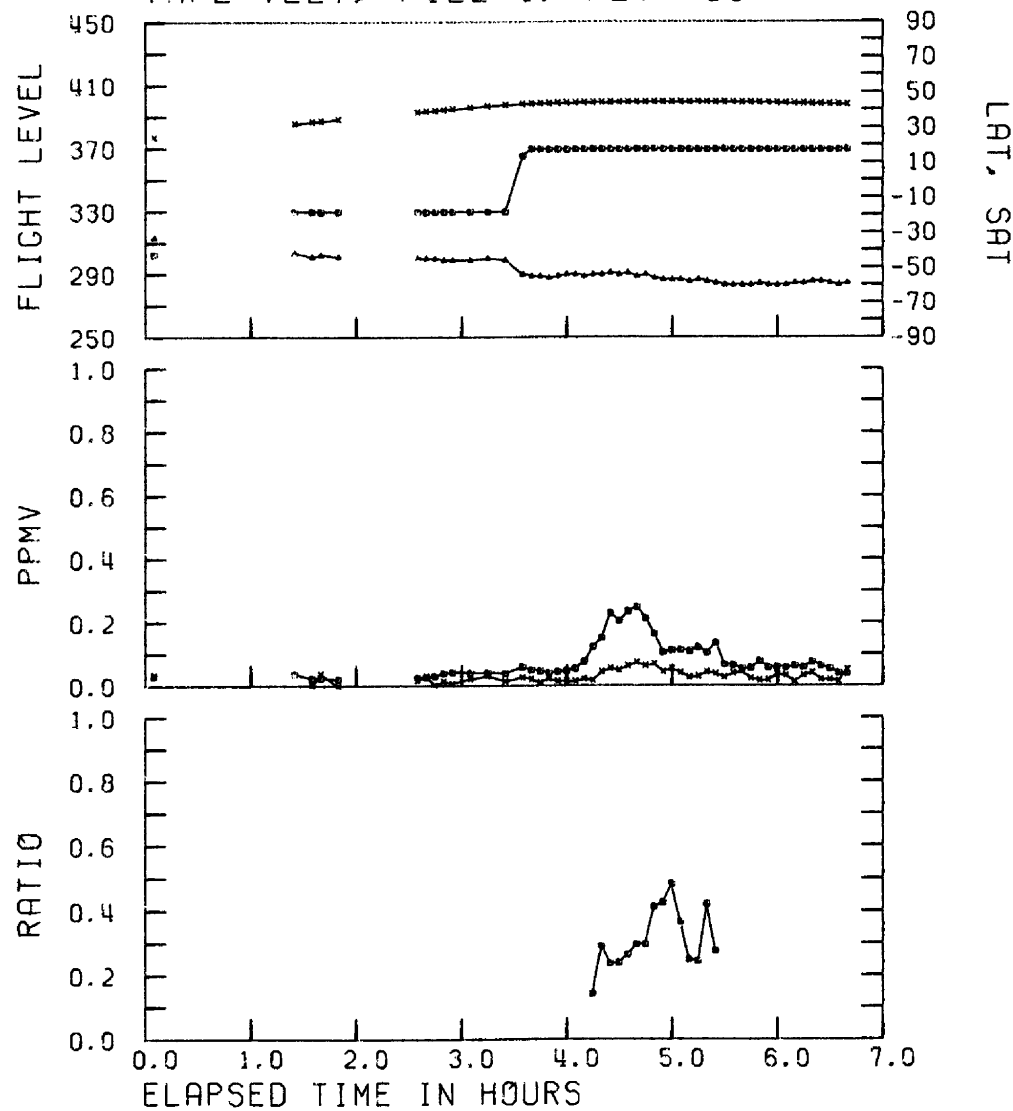
ORD TO HNL DEPARTURE 1 NOV 78
TAPE VL27, FILE 1, FLT 54



ORD TO JFK
DEPARTURE 2 NOV 78
TAPE VL27,
FILE 1, FLT 56



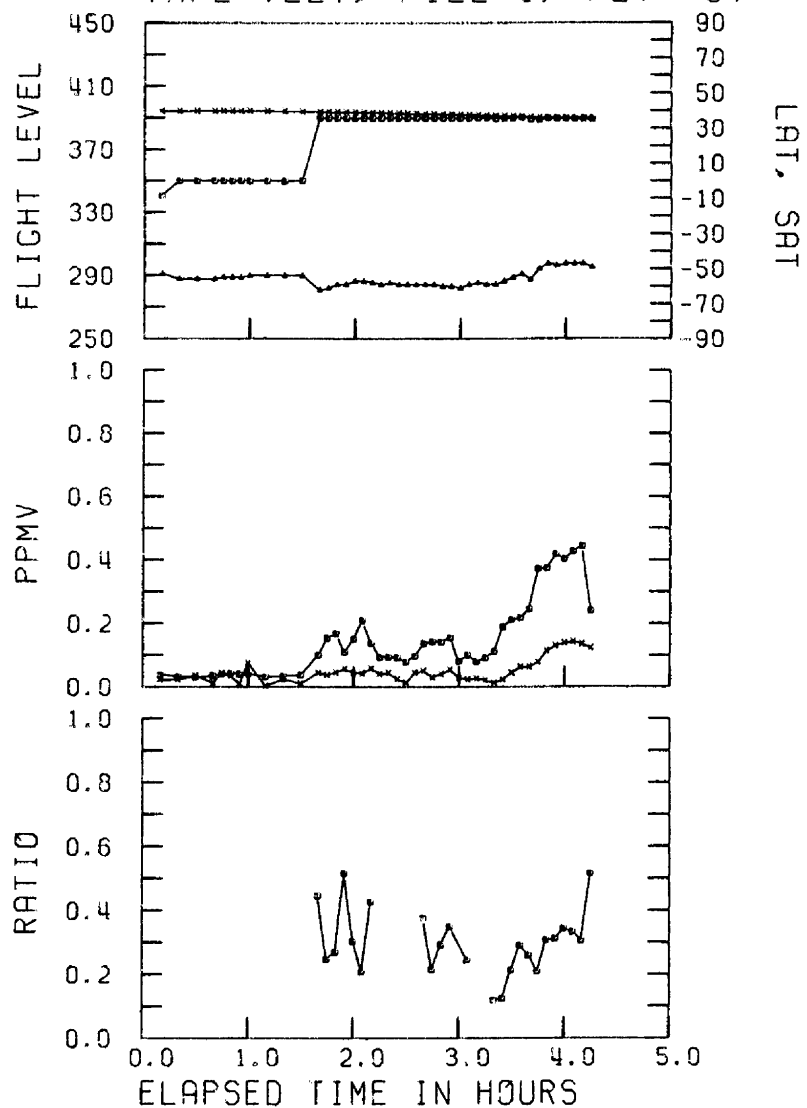
HNL TO ORD DEPARTURE 2 NOV 78
TAPE VL27, FILE 1, FLT 55



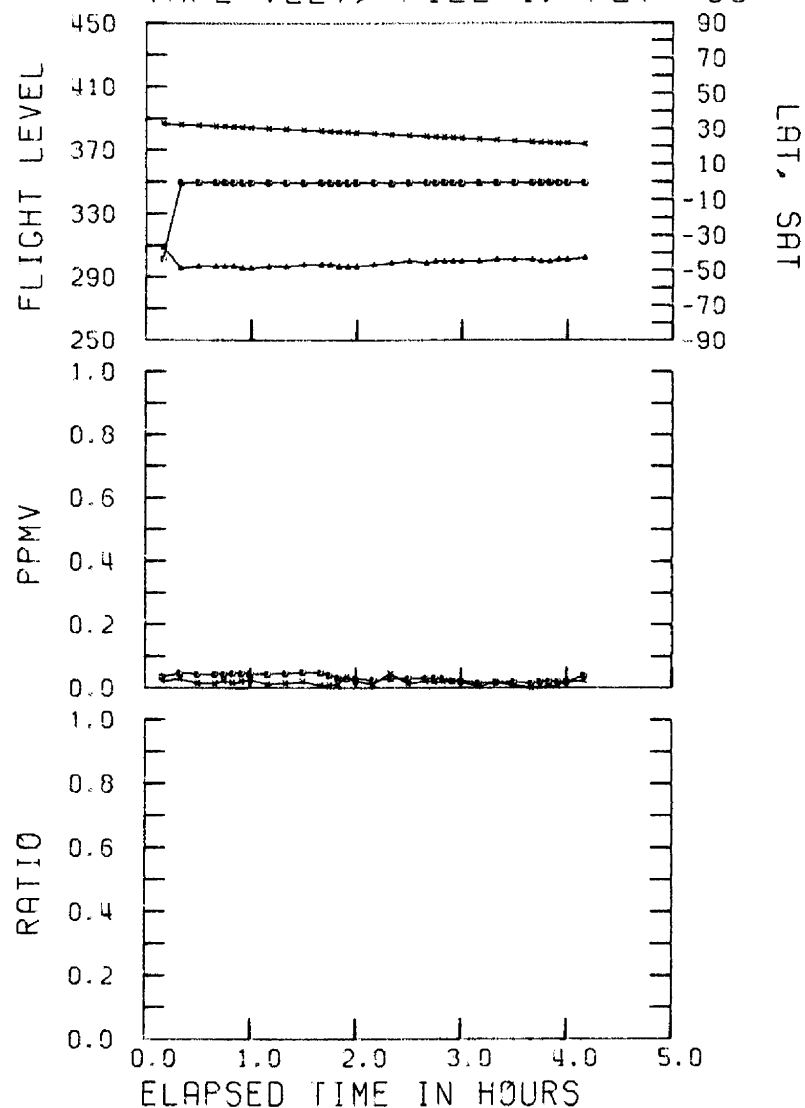
82-28

C-29

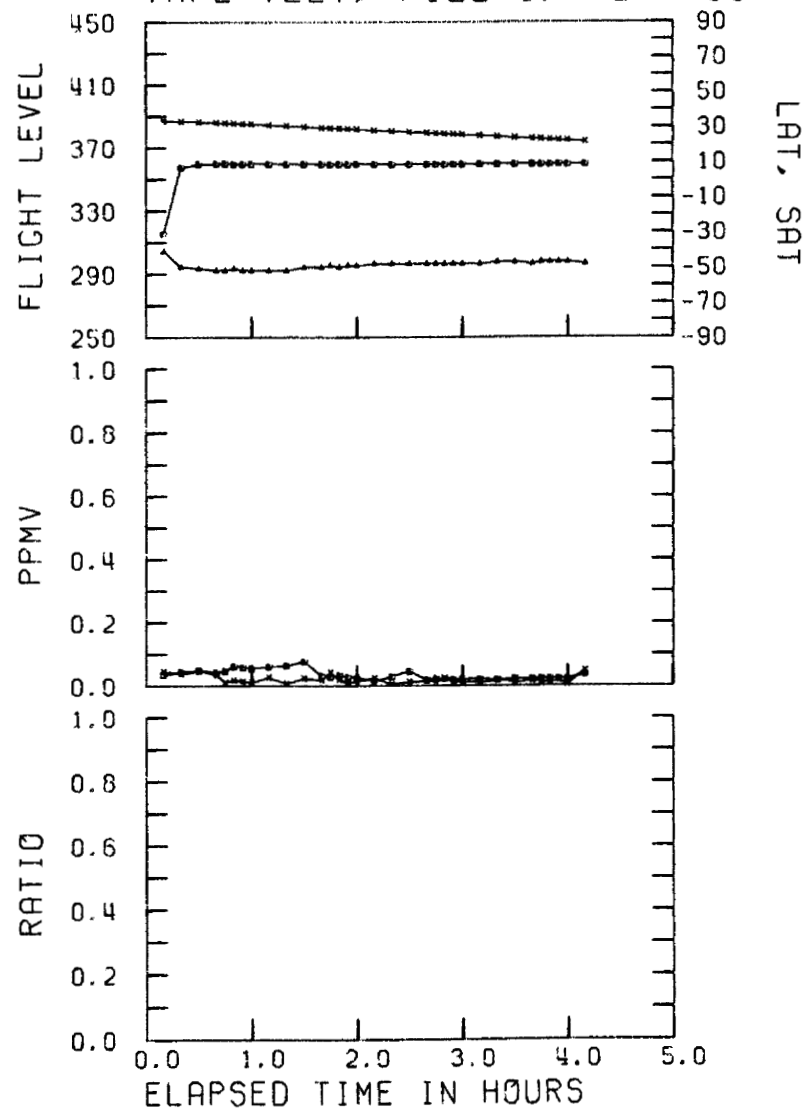
JFK TO LAX DEPARTURE 2 NOV 78
TAPE VL27, FILE 1, FLT 57



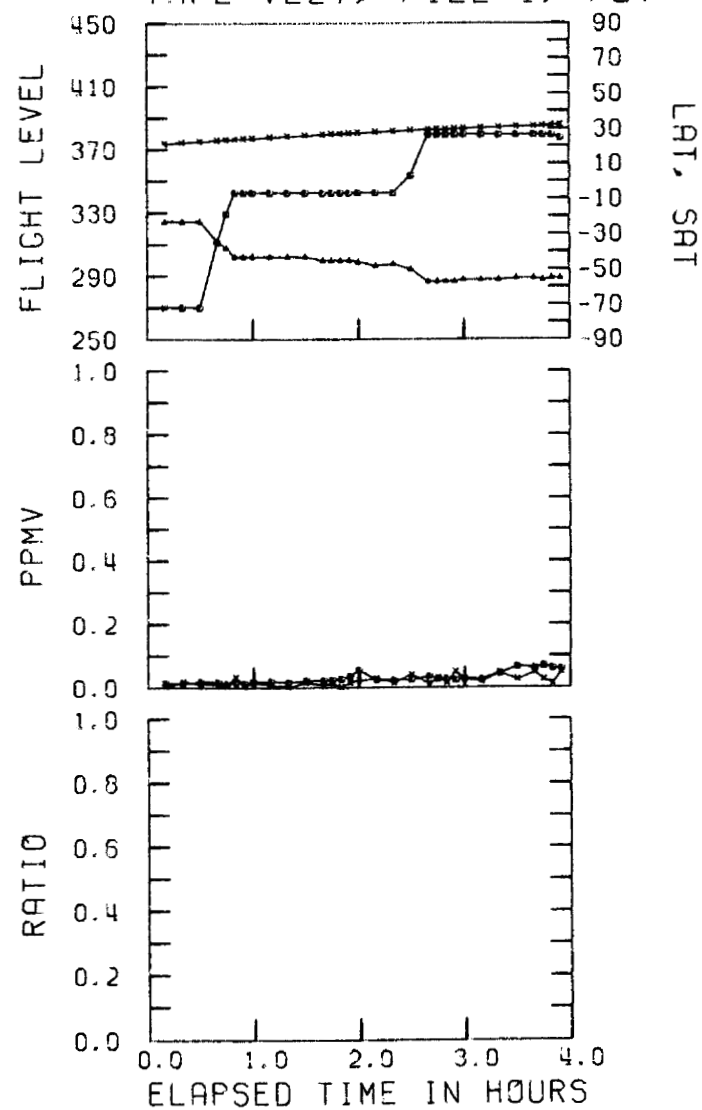
LAX TO HNL DEPARTURE 3 NOV 78
TAPE VL27, FILE 1, FLT 58



LAX TO HNL DEPARTURE 3 NOV 78
TAPE VL27, FILE 1, FLT 59

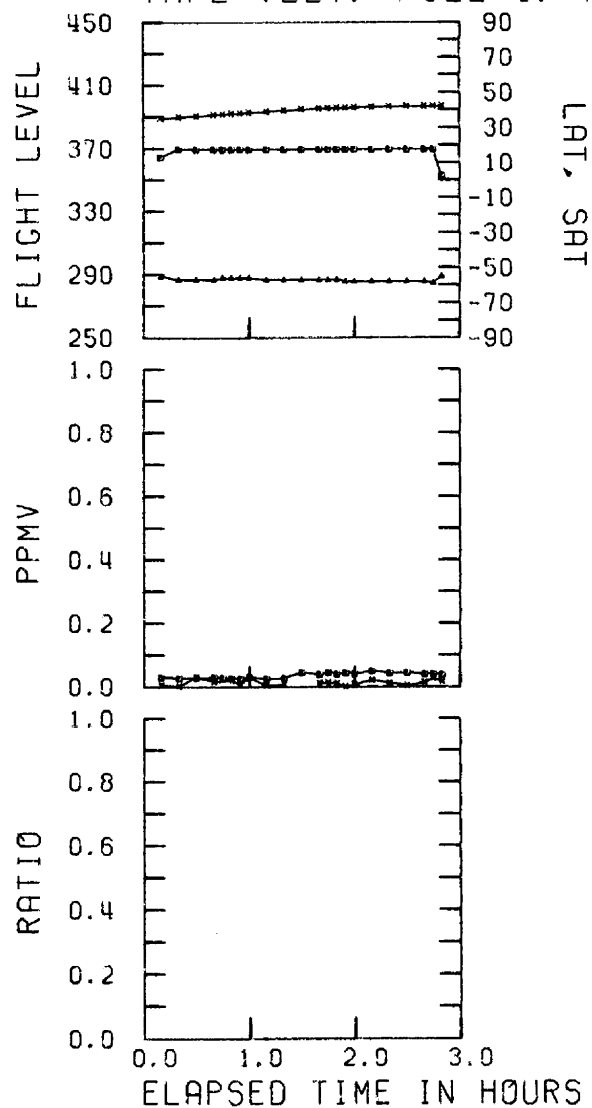


ITO TO LAX DEPARTURE 4 NOV 78
TAPE VL27, FILE 1, FLT 60

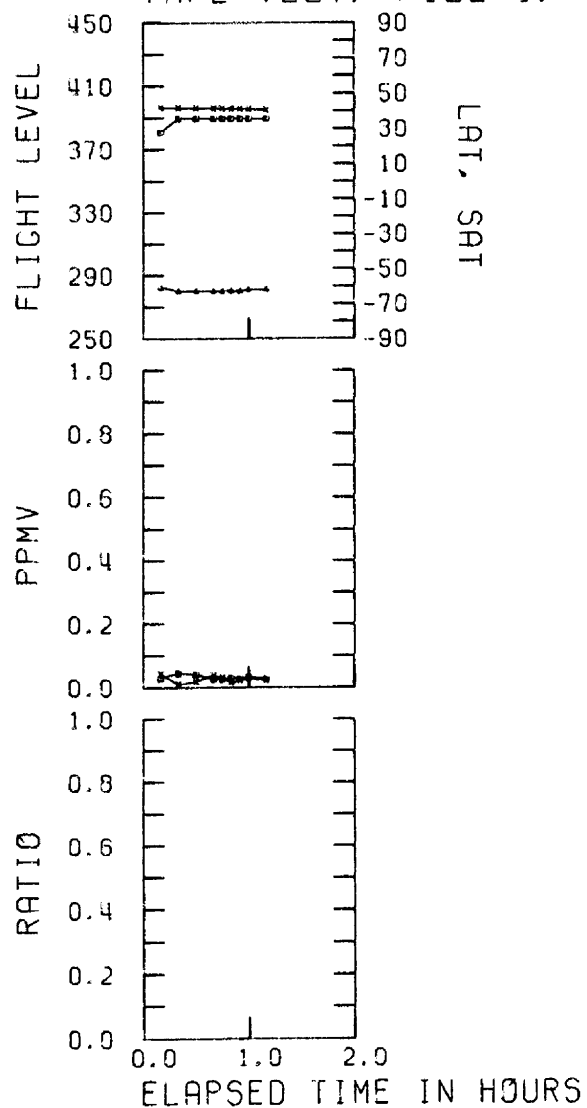


C-31

LAX TO ORD DEPARTURE 4 NOV 78
TAPE VL27, FILE 1, FLT 61

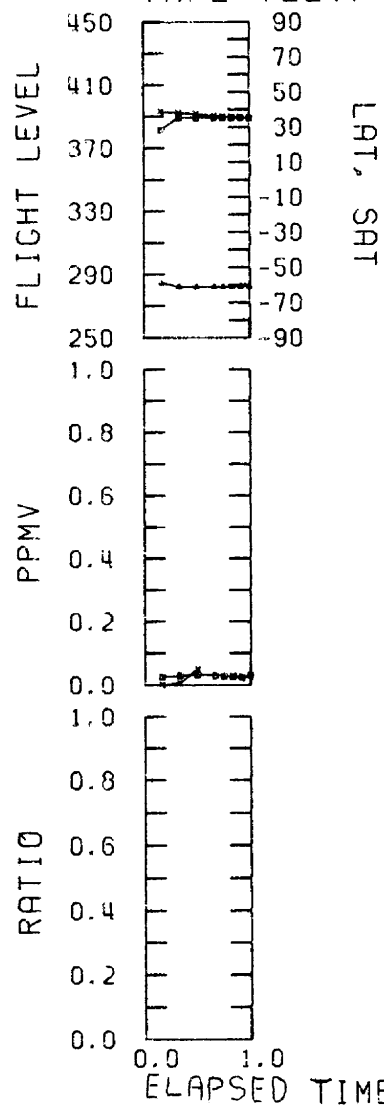


ORD TO DEN DEPARTURE 4 NOV 78
TAPE VL27, FILE 1, FLT 62

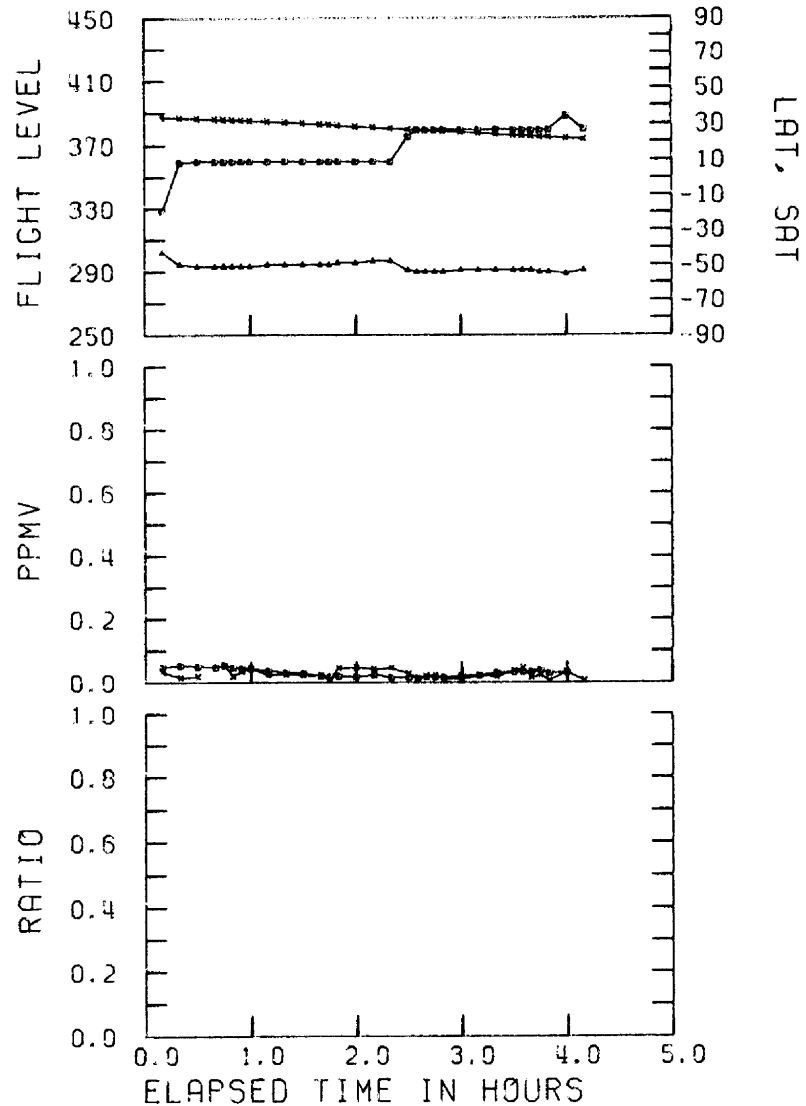


C-32

DEN TO LAX DEPARTURE 4 NOV 78
TAPE VL27, FILE 1, FLT 63

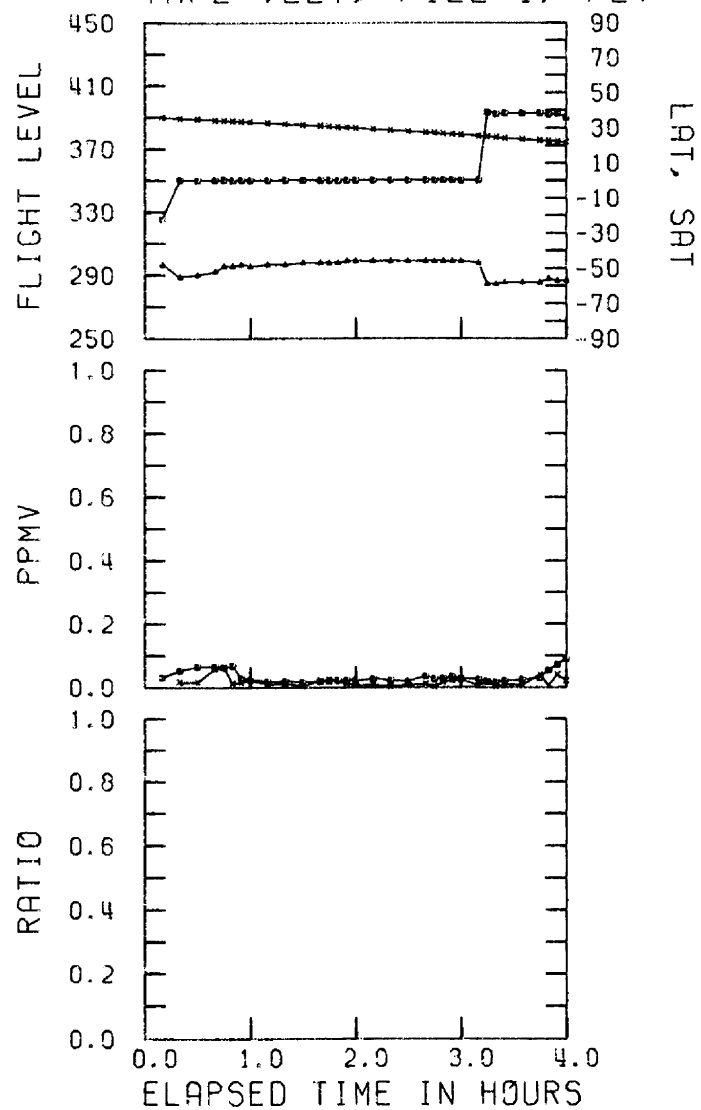


LAX TO HNL DEPARTURE 4 NOV 78
TAPE VL27, FILE 1, FLT 64

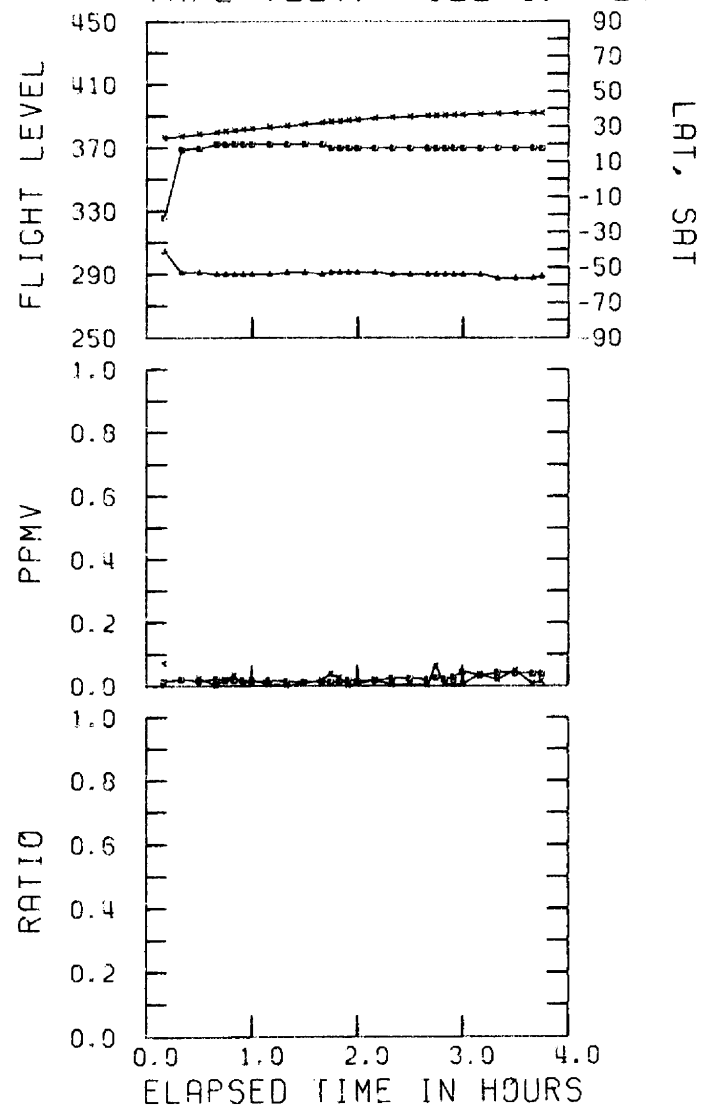


C-33

SFO TO HNL DEPARTURE 6 NOV 78
TAPE VL27, FILE 1, FLT 65

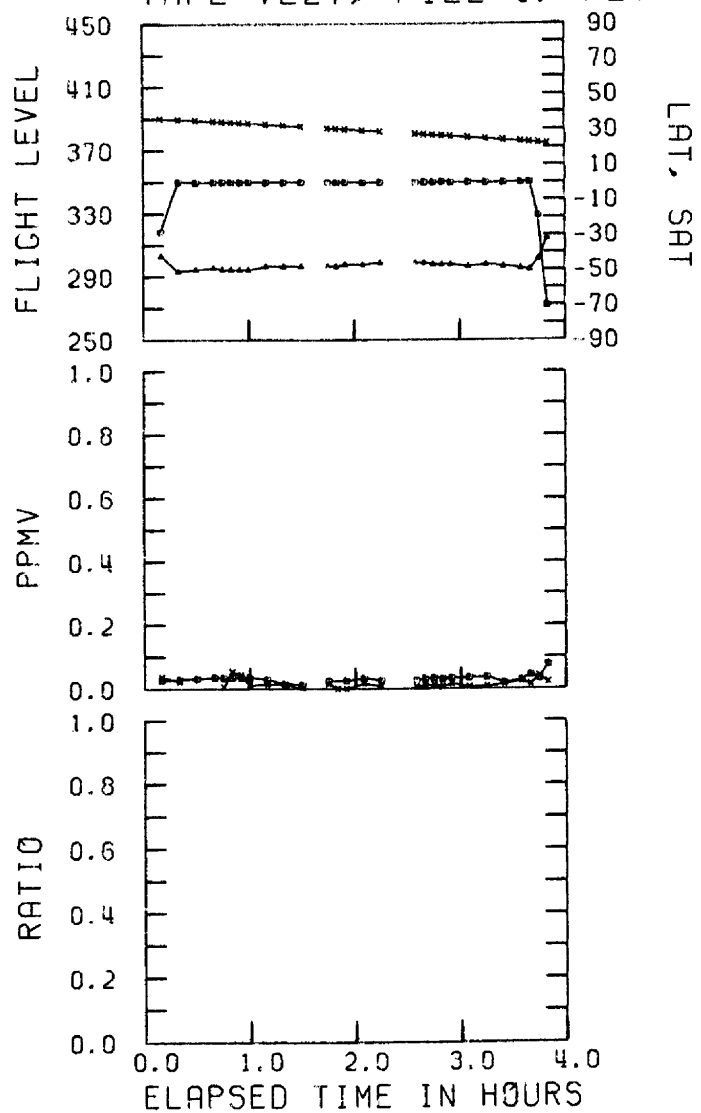


HNL TO SFO DEPARTURE 6 NOV 78
TAPE VL27, FILE 1, FLT 66

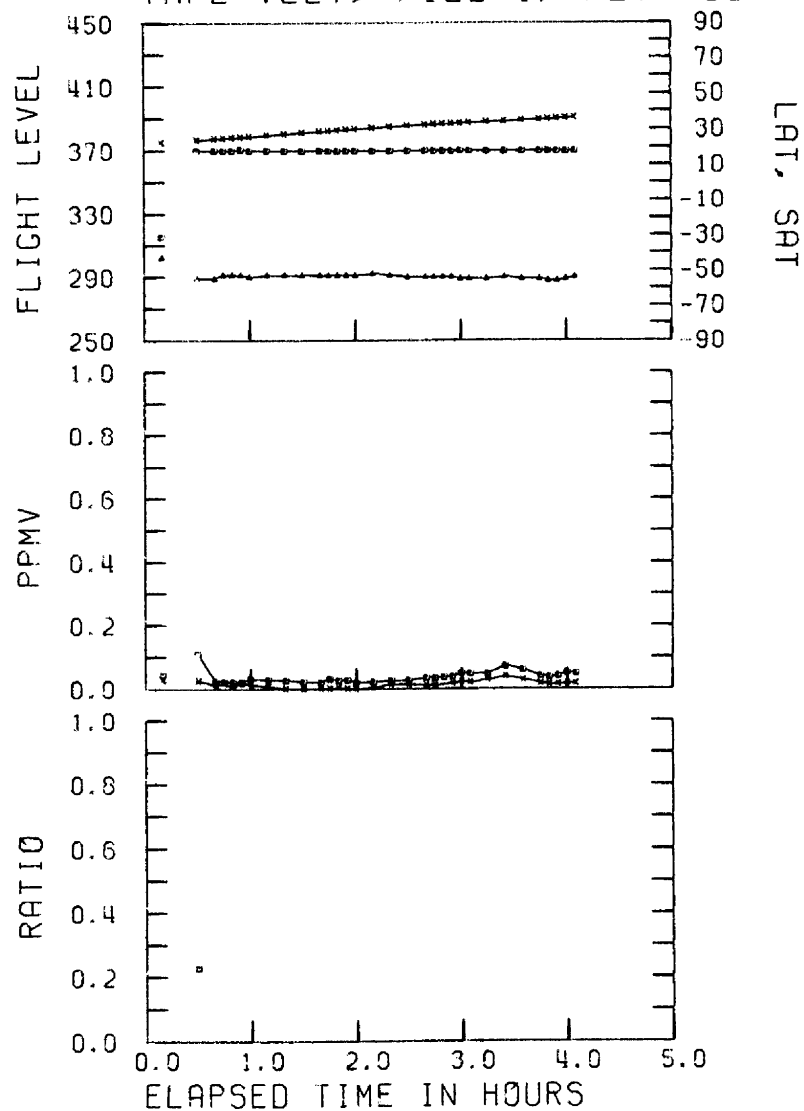


C-34

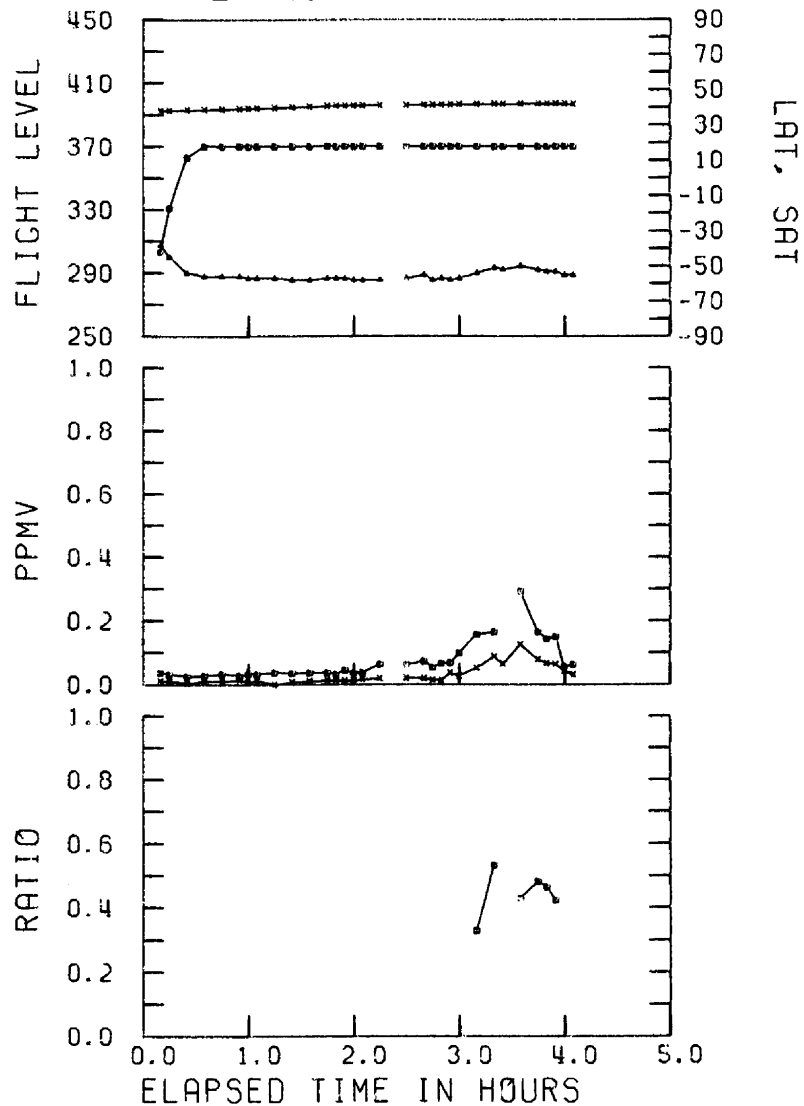
SFO TO HNL DEPARTURE 7 NOV 78
TAPE VL27, FILE 1, FLT 67



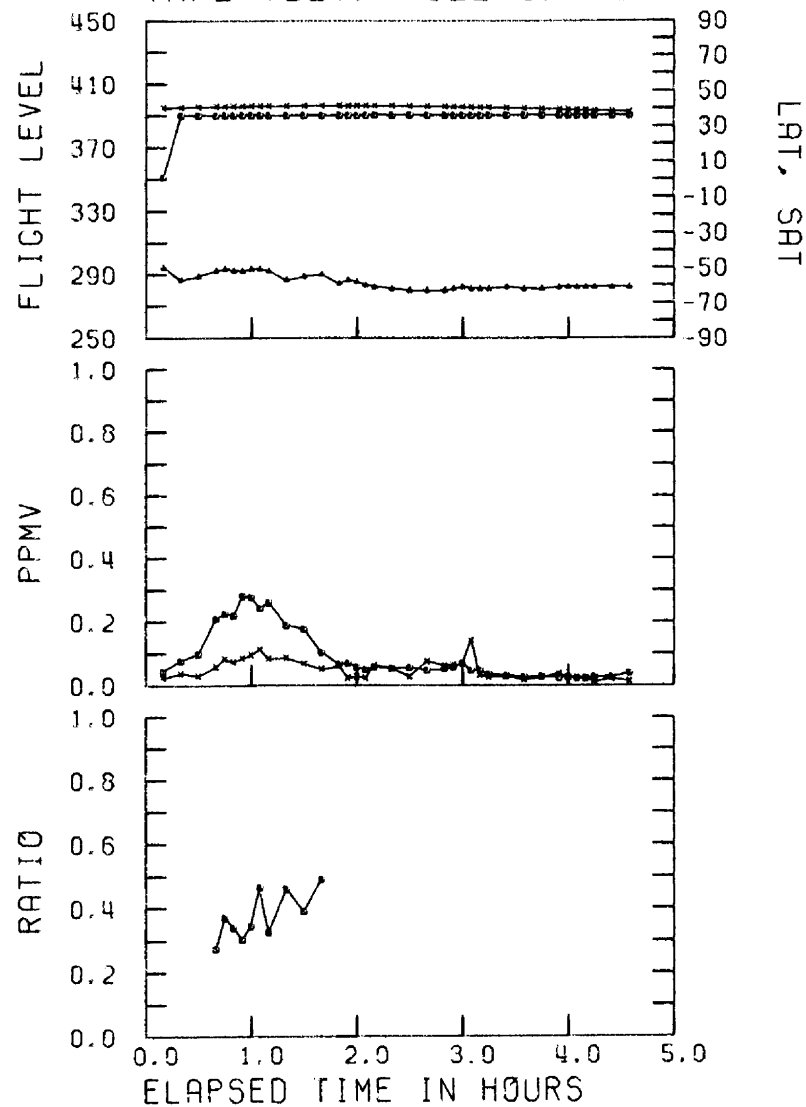
HNL TO SFO DEPARTURE 7 NOV 78
TAPE VL27, FILE 1, FLT 68



SFO TO JFK DEPARTURE 7 NOV 78
TAPE VL27, FILE 1, FLT 69

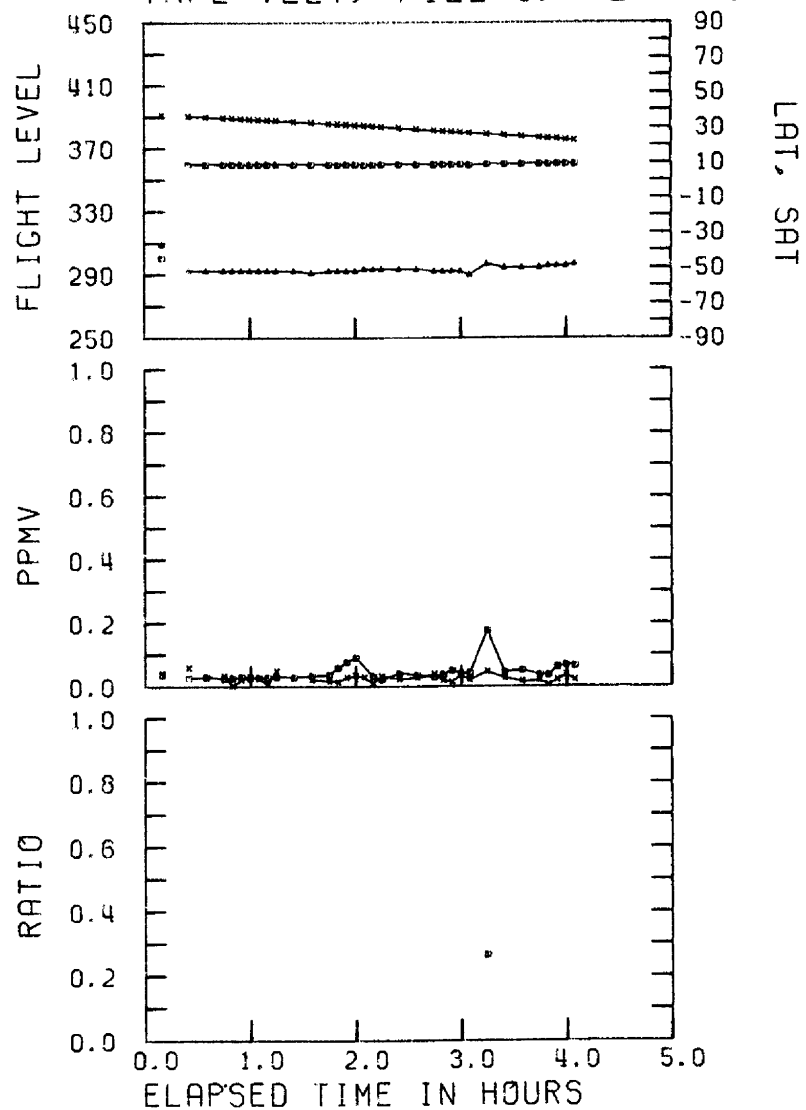


JFK TO SFO DEPARTURE 7 NOV 78
TAPE VL27, FILE 1, FLT 70

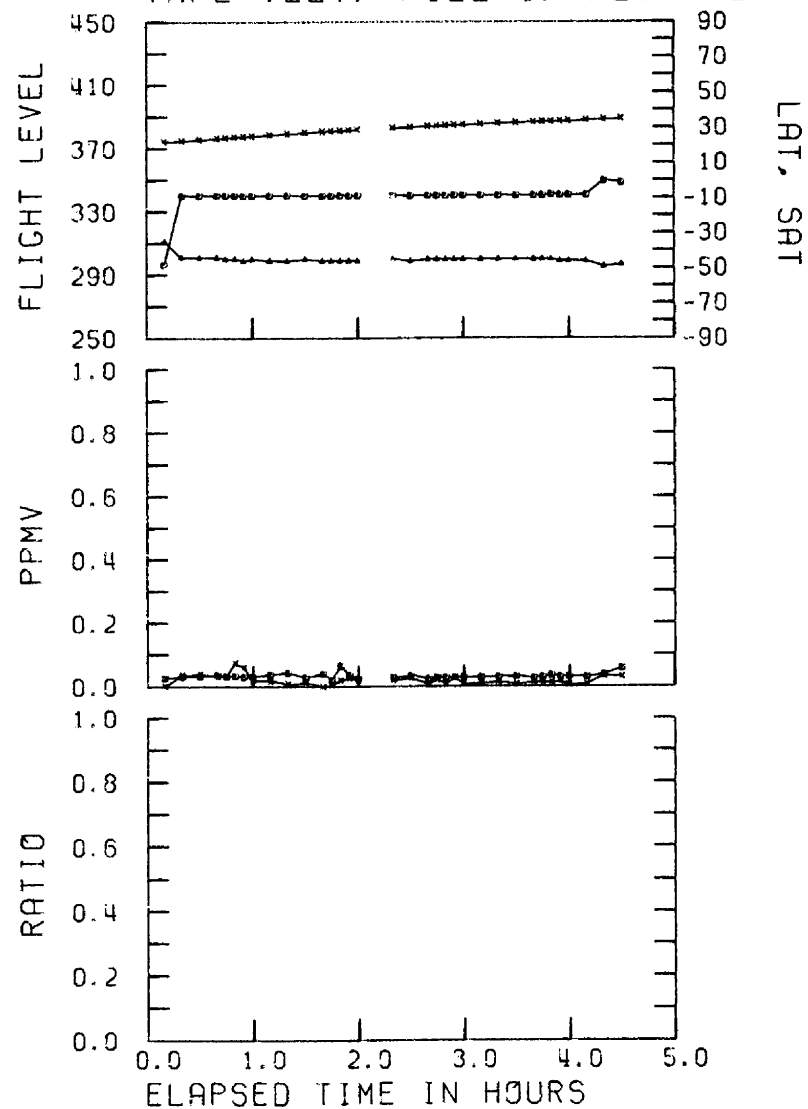


C-36

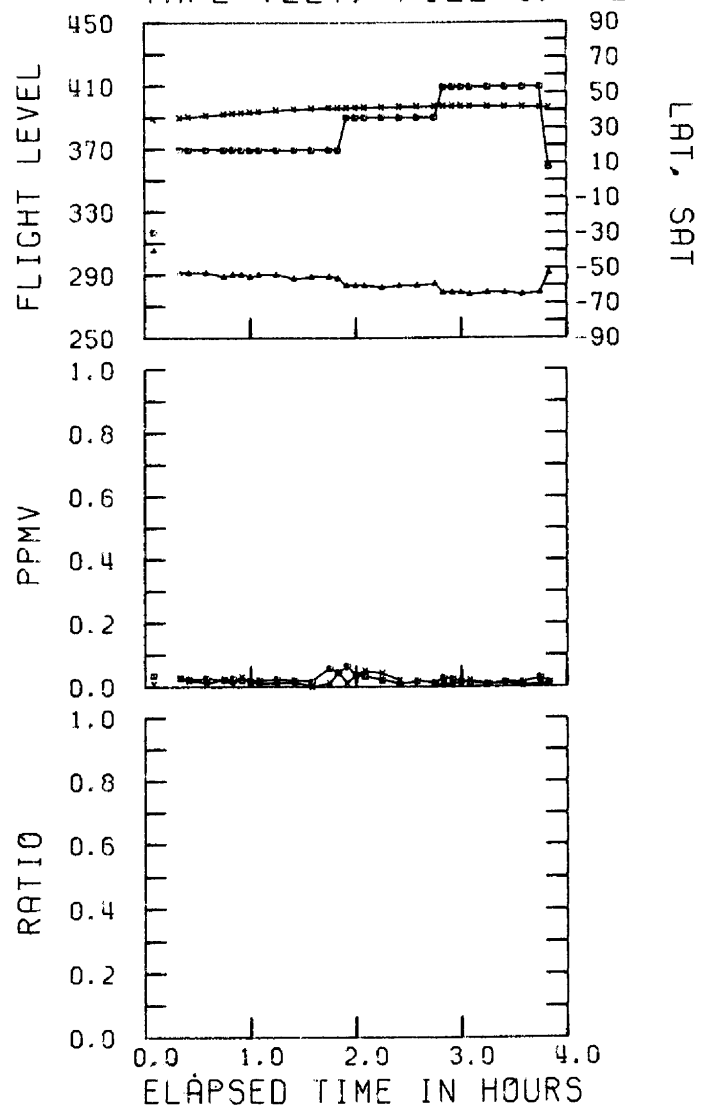
SFO TO HNL DEPARTURE 8 NOV 78
TAPE VL27, FILE 1, FLT 71



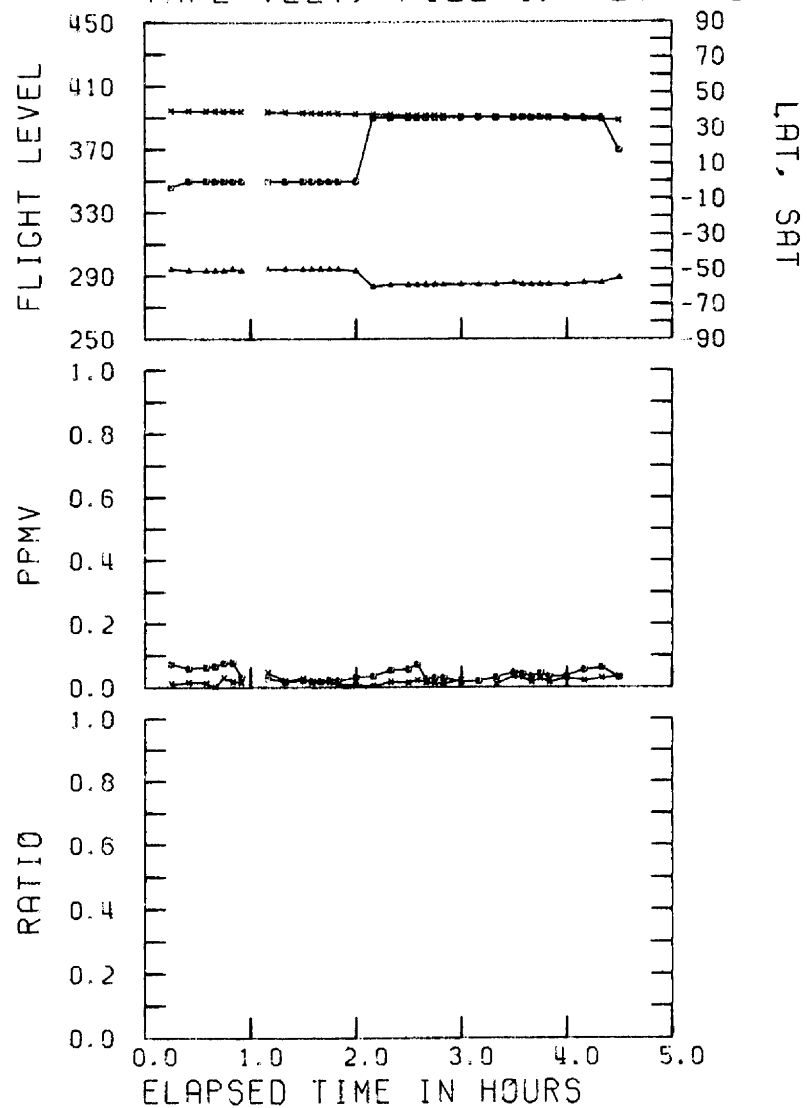
HNL TO LAS DEPARTURE 9 NOV 78
TAPE VL27, FILE 1, FLT 72



LAX TO JFK DEPARTURE 9 NOV 78
TAPE VL27, FILE 1, FLT 74

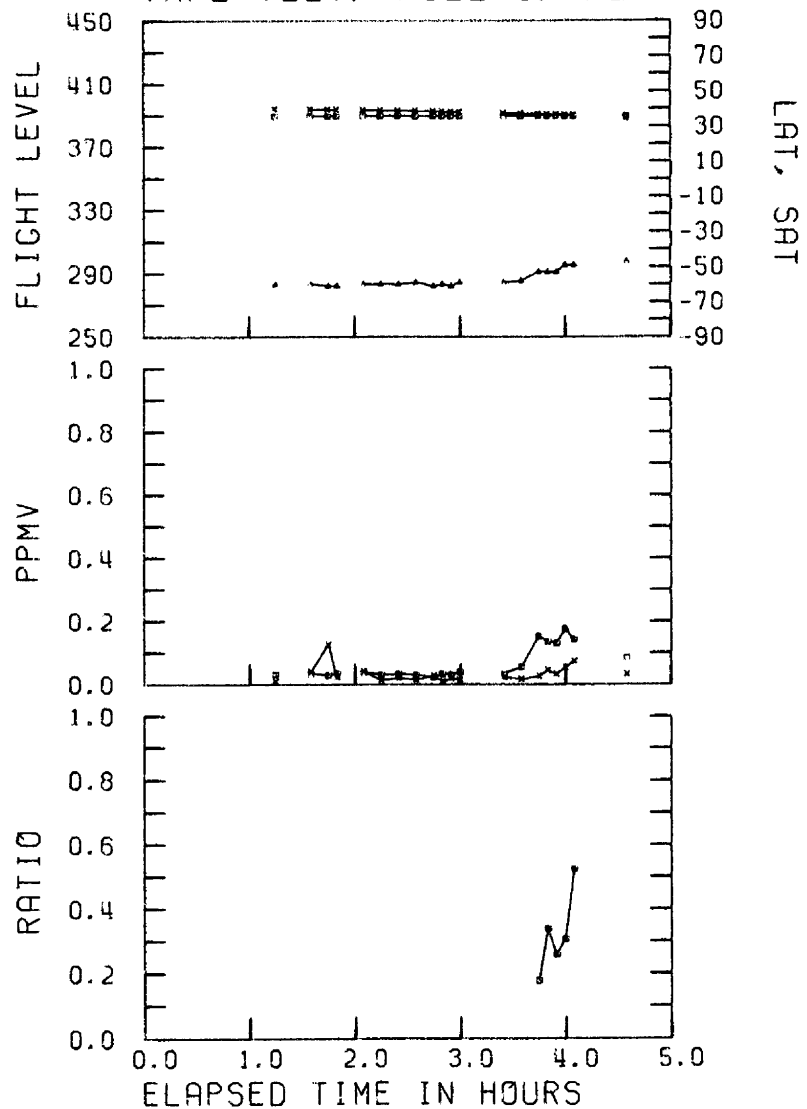


JFK TO LAX DEPARTURE 10 NOV 78
TAPE VL27, FILE 1, FLT 75

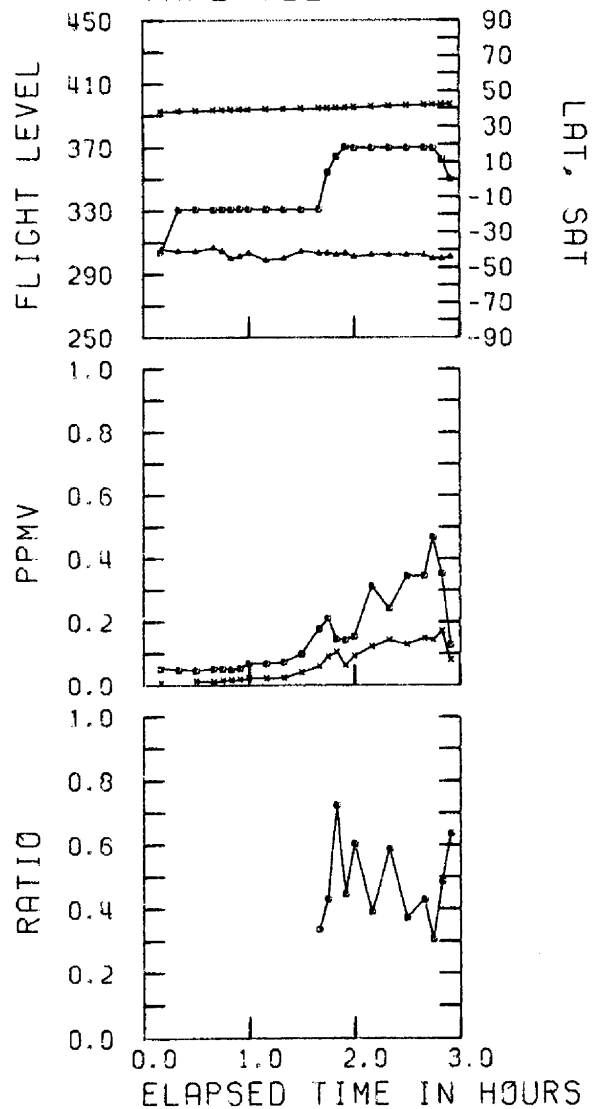


C-38

JFK TO LAX DEPARTURE 11 NOV 78
TAPE VL27, FILE 1, FLT 77

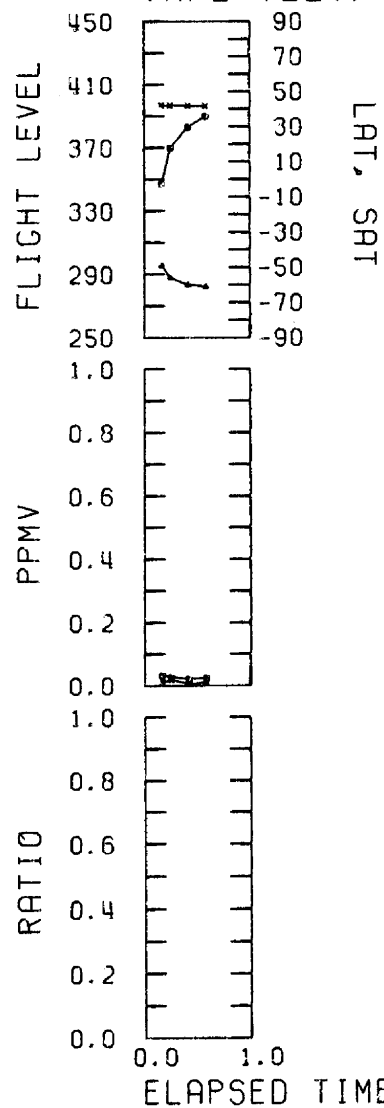


SFO TO ORD DEPARTURE 4 DEC 78
TAPE VL27, FILE 1, FLT 79

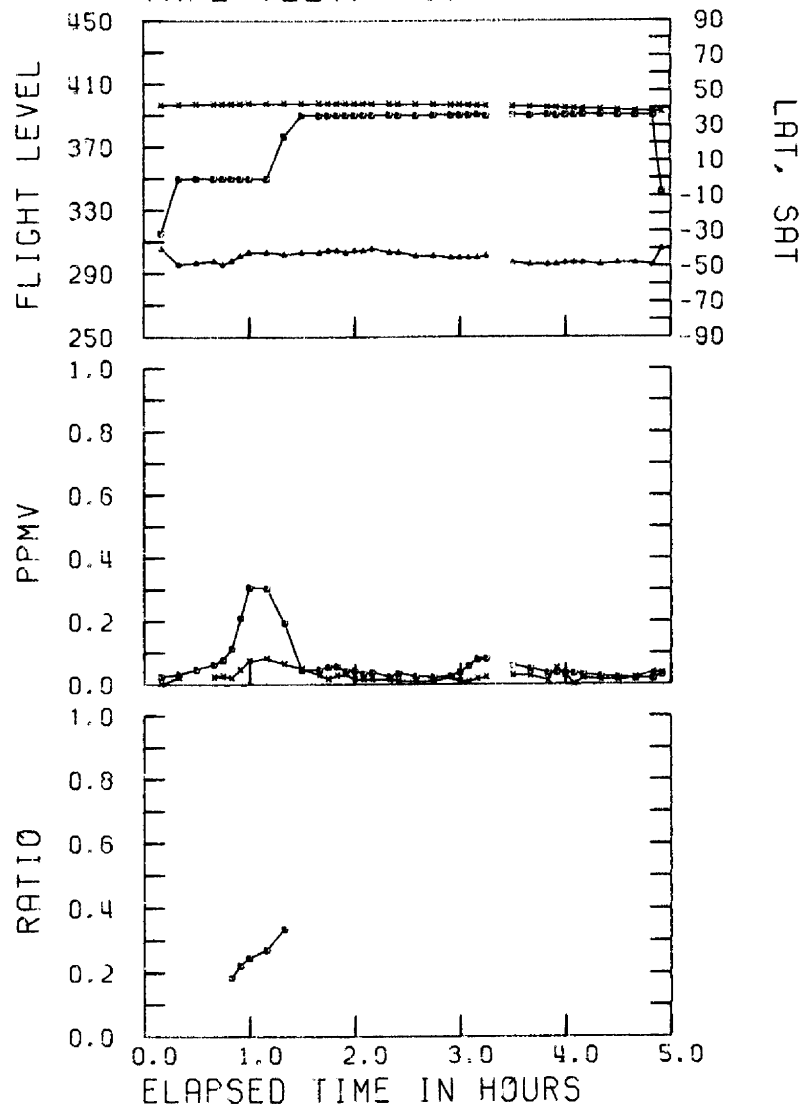


C-39

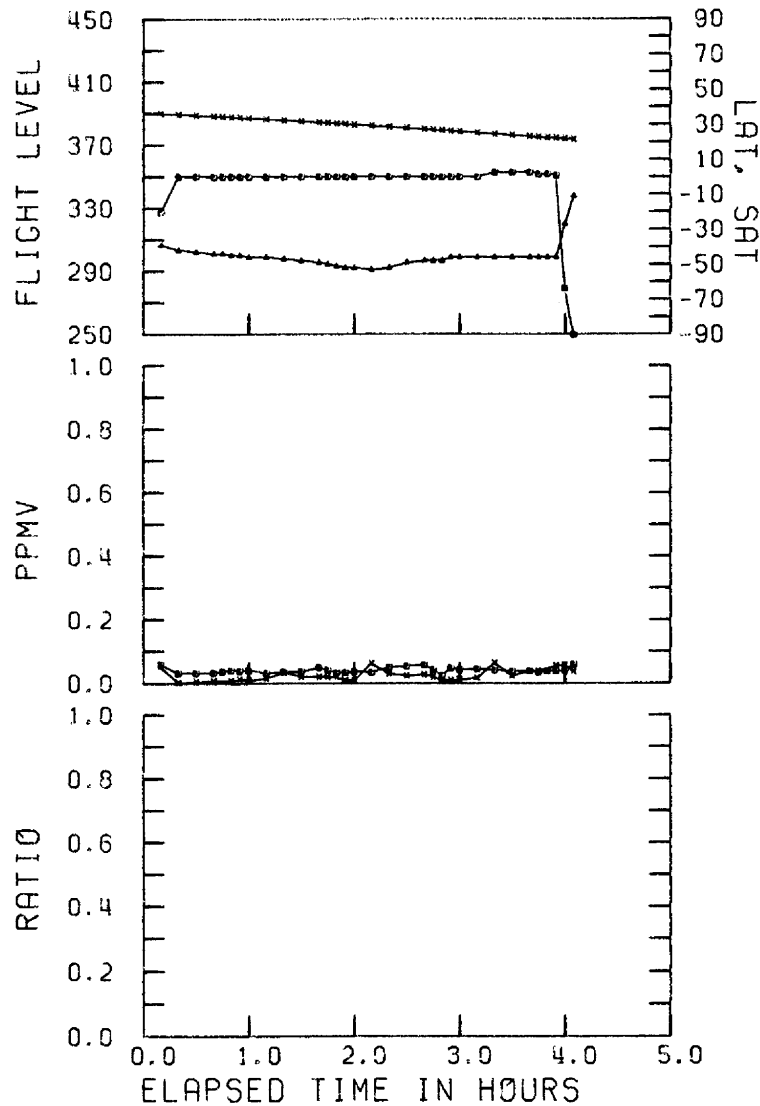
ORD TO JFK DEPARTURE 4 DEC 78
TAPE VL27, FILE 1, FLT 80



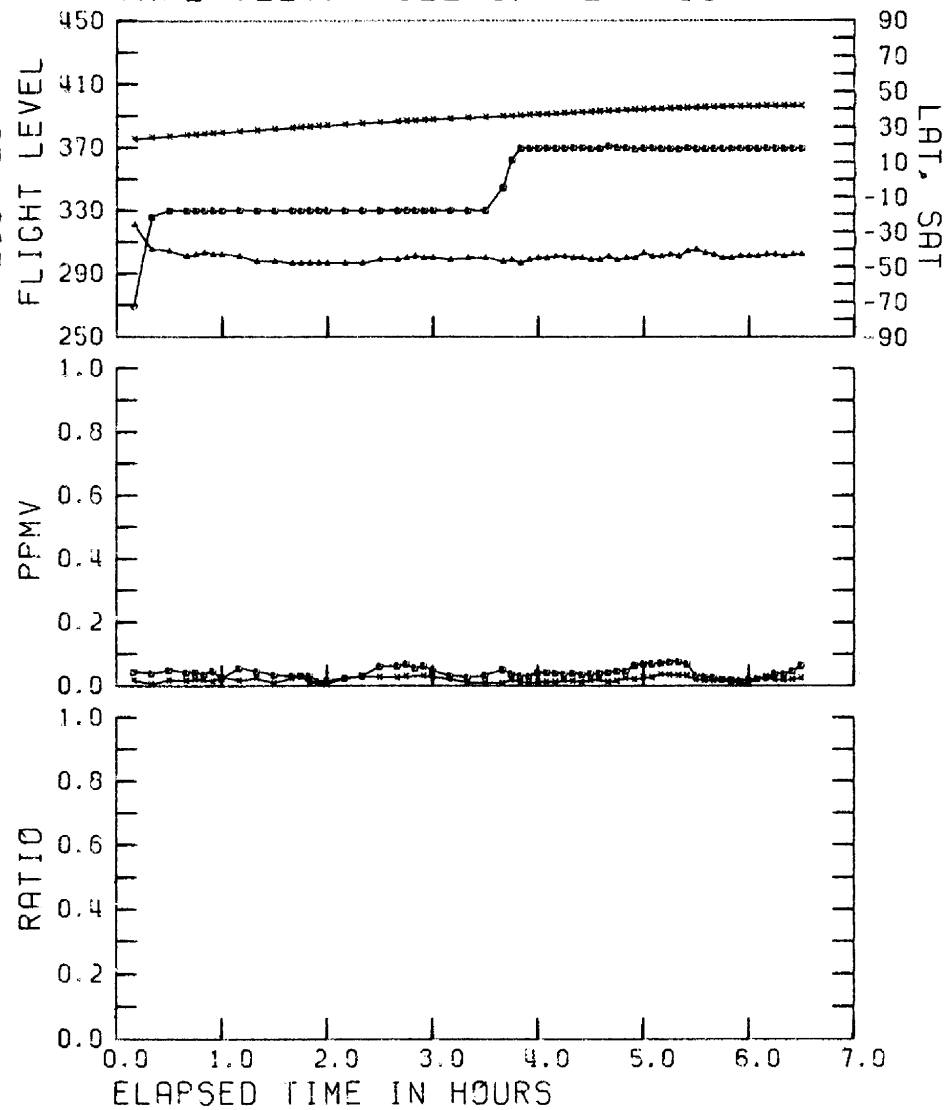
JFK TO SFO DEPARTURE 4 DEC 78
TAPE VL27, FILE 1, FLT 81



SFO TO HNL
 DEPARTURE 4 DEC 78
 TAPE VL27, FILE 1, FLT 82

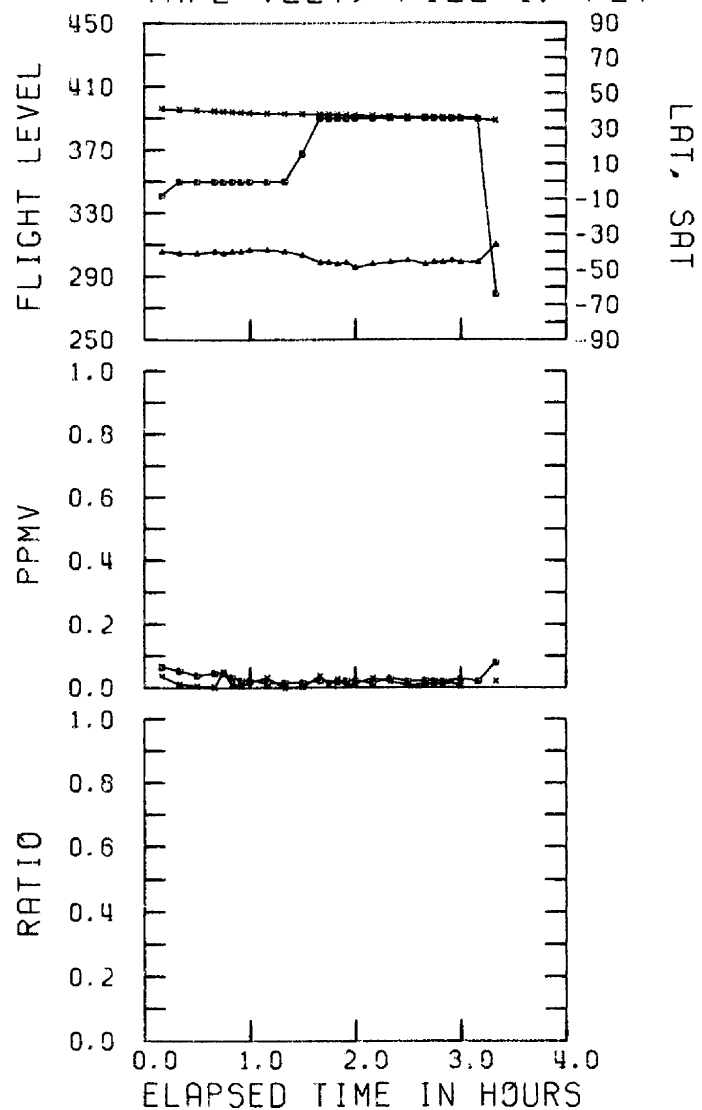


HNL TO ORD DEPARTURE 5 DEC 78
 TAPE VL27, FILE 1, FLT 83

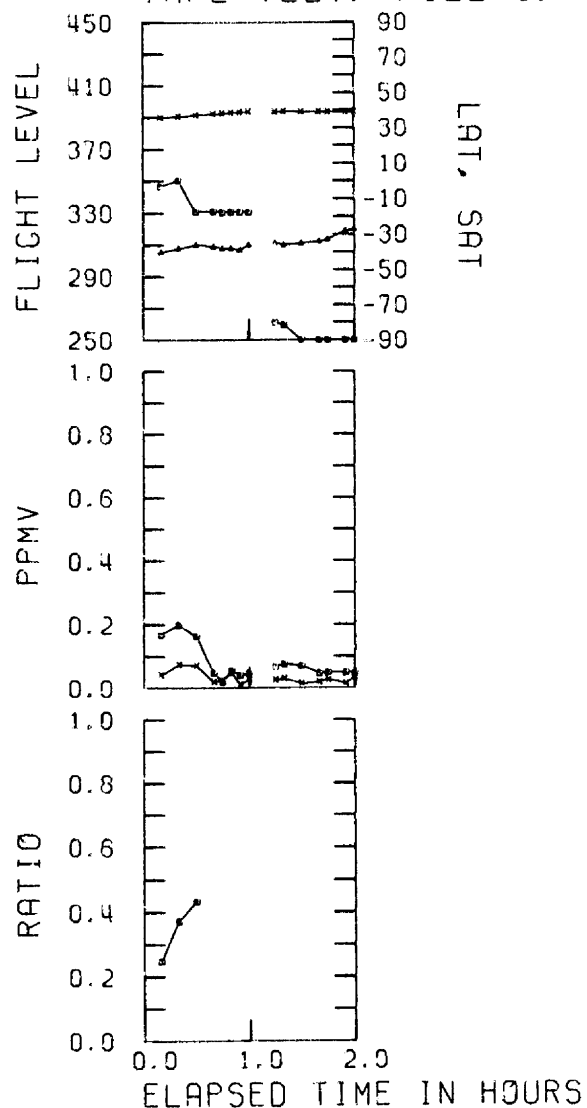


C-40

ORD TO LAX DEPARTURE 5 DEC 78
TAPE VL27, FILE 1, FLT 84

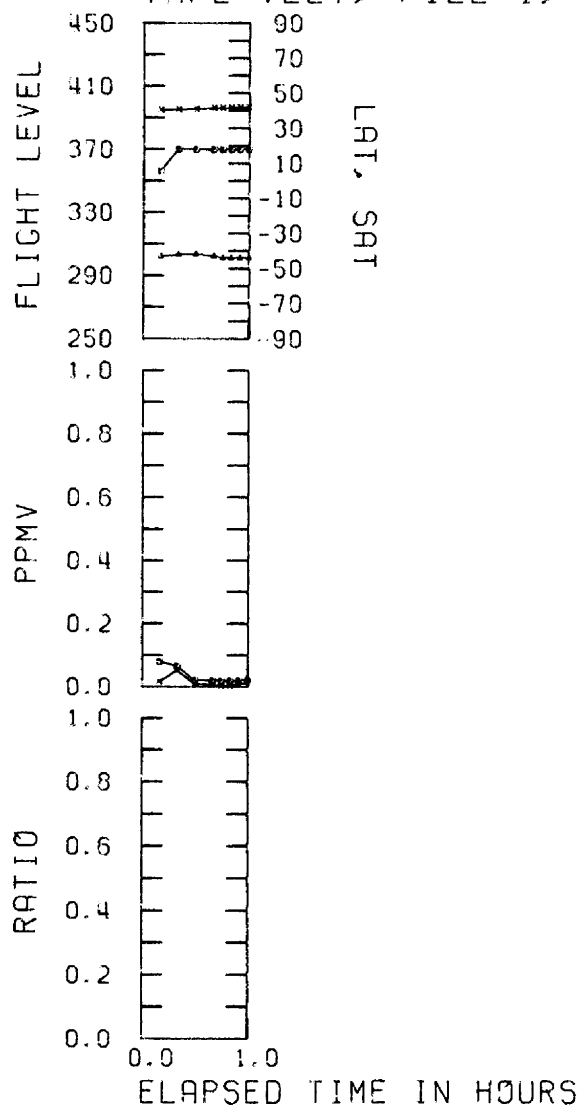


LAX TO DEN DEPARTURE 6 DEC 78
TAPE VL27, FILE 1, FLT 85

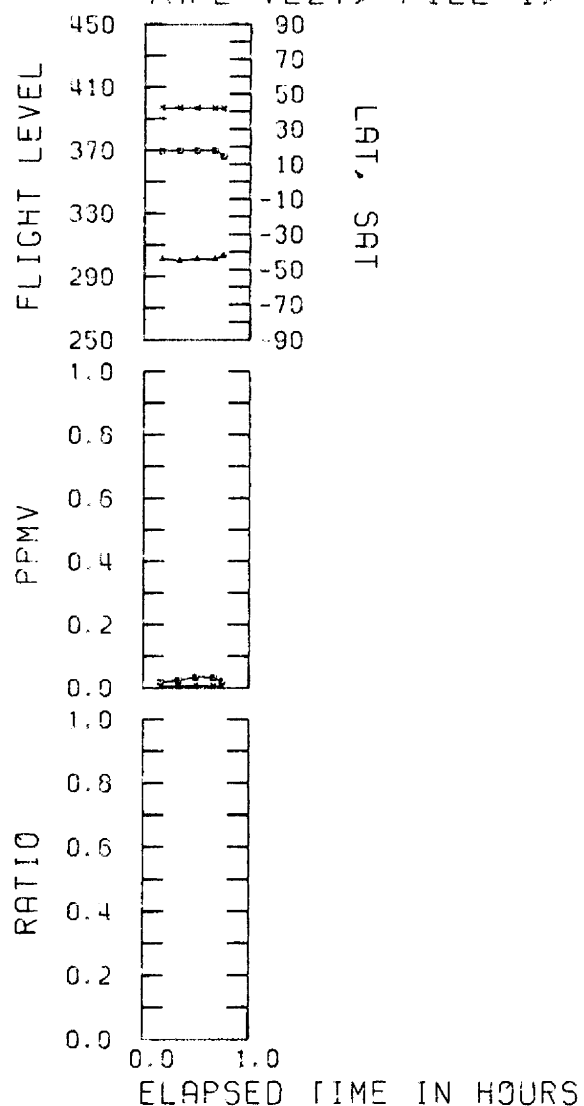


C-42

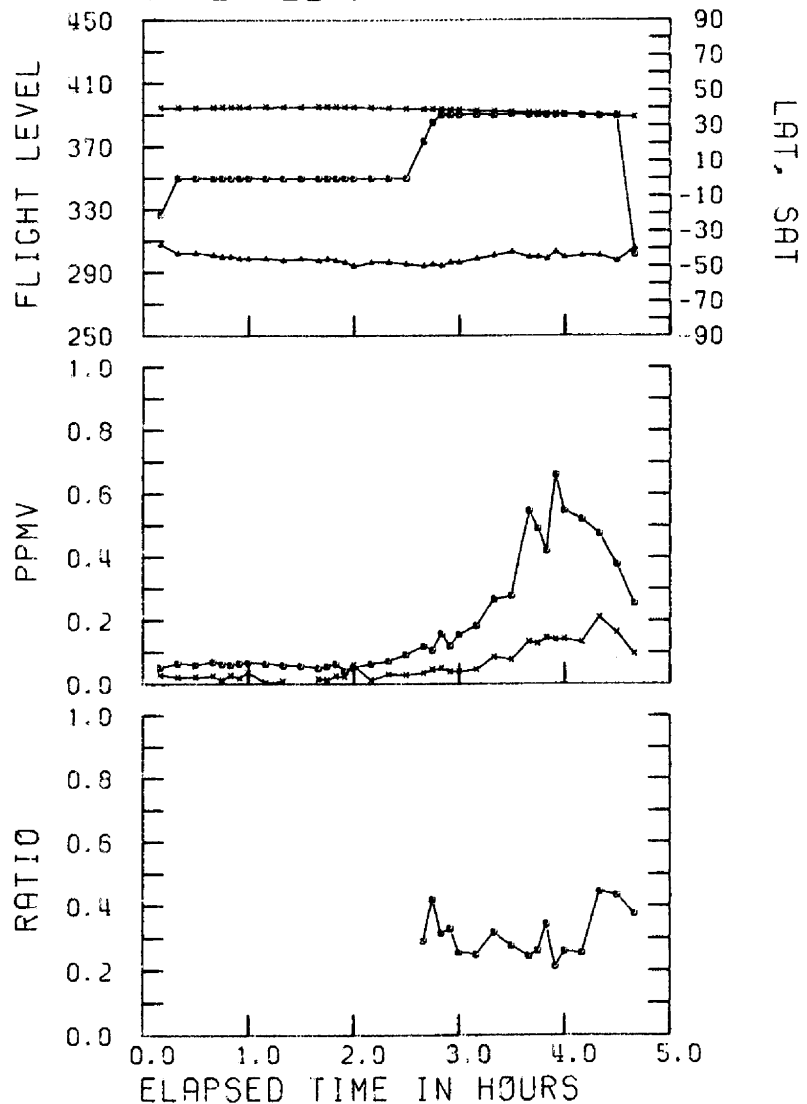
DEN TO ORD DEPARTURE 6 DEC 78
TAPE VL27, FILE 1, FLT 86



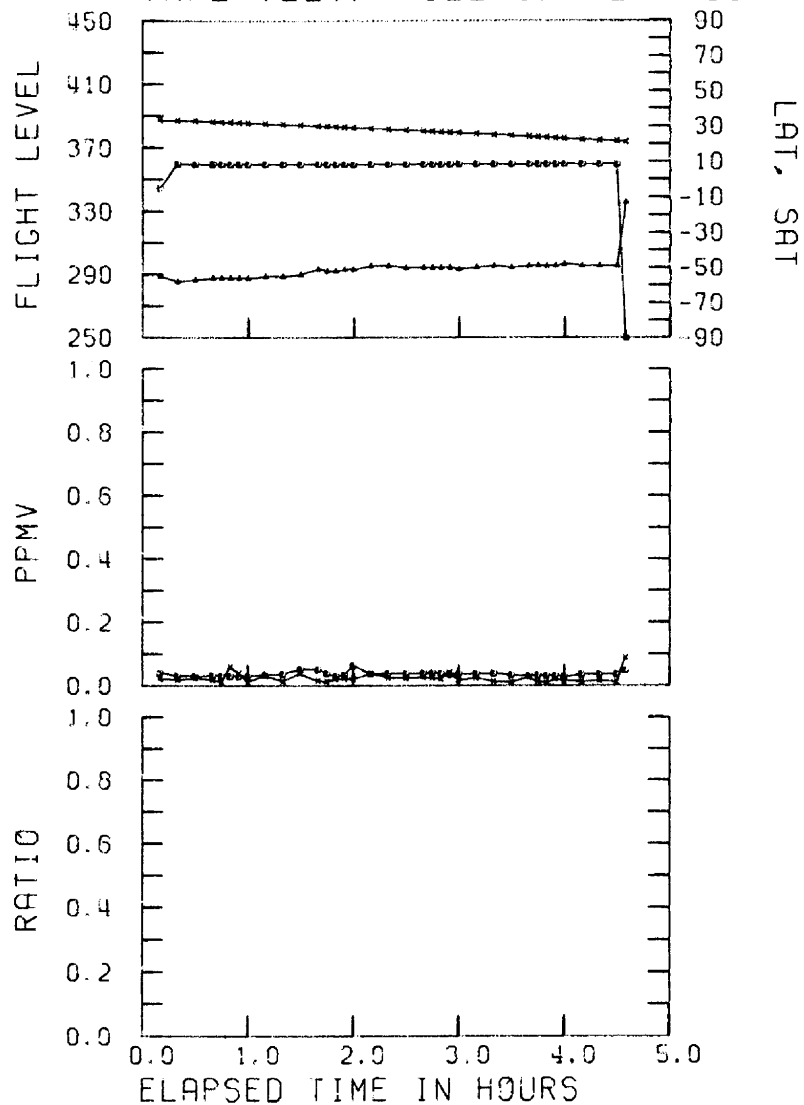
ORD TO JFK DEPARTURE 6 DEC 78
TAPE VL27, FILE 1, FLT 87



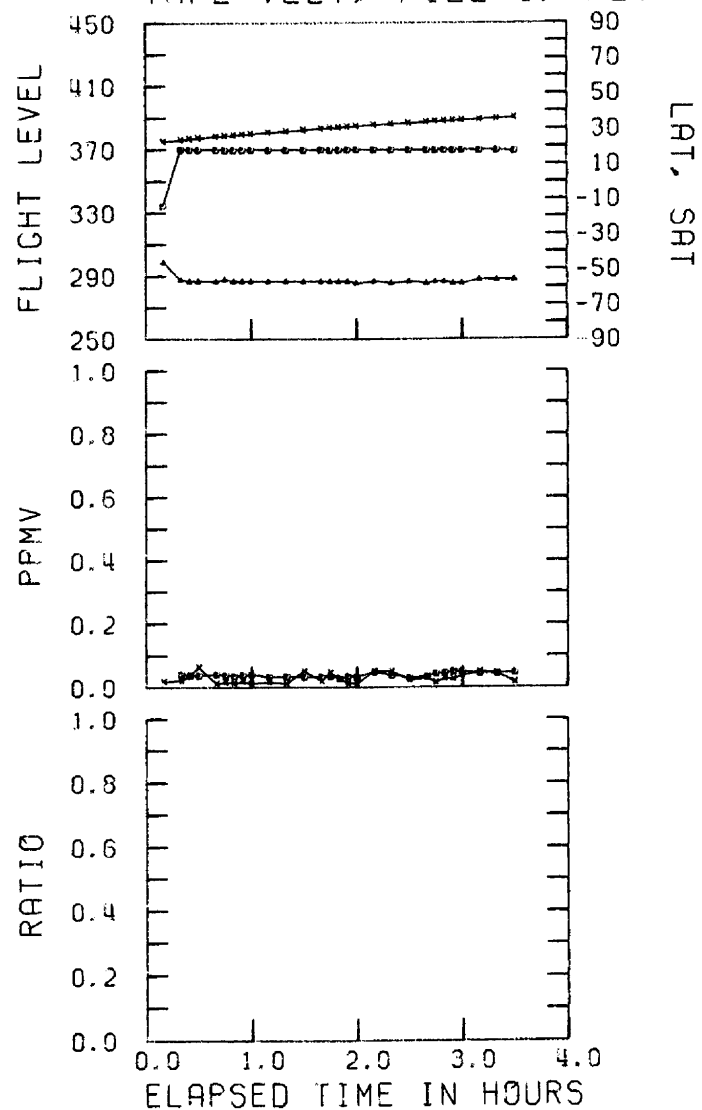
JFK TO LAX DEPARTURE 6 DEC 78
TAPE VL27, FILE 1, FLT 88



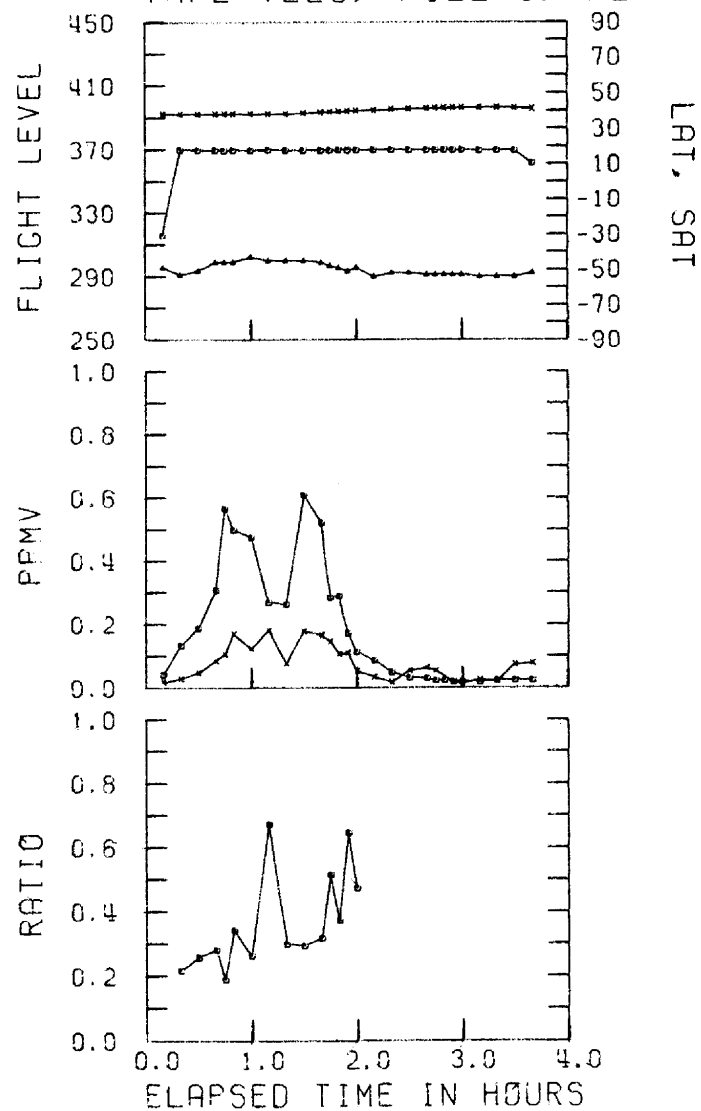
LAX TO HNL DEPARTURE 7 DEC 78
TAPE VL27, FILE 1, FLT 89



HNL TO SFO DEPARTURE 7 DEC 78
TAPE VL27, FILE 1, FLT 90

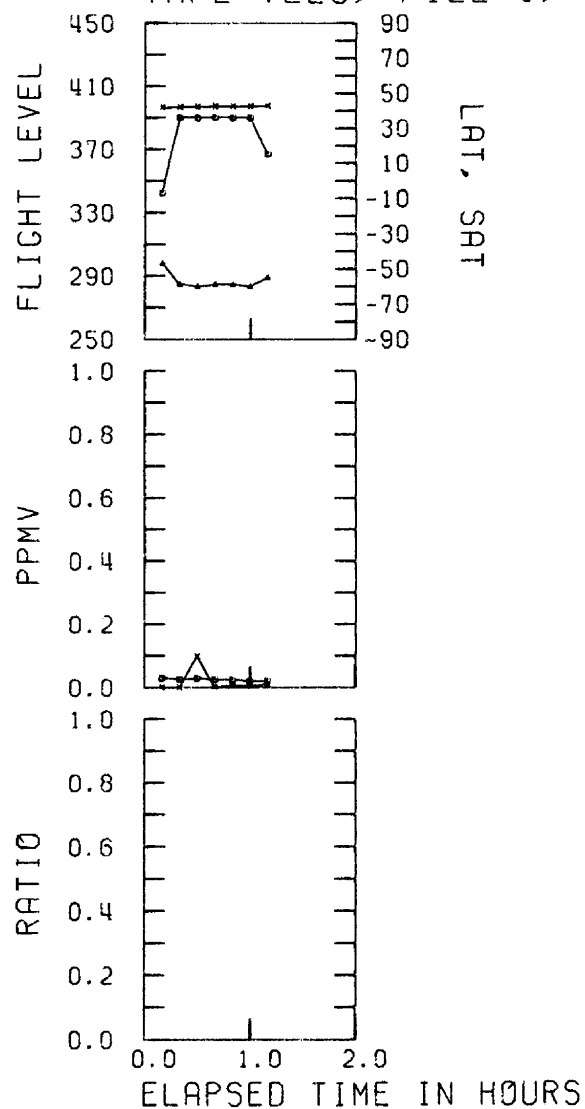


SFO TO JFK DEPARTURE 8 DEC 78
TAPE VL28, FILE 1, FLT 1

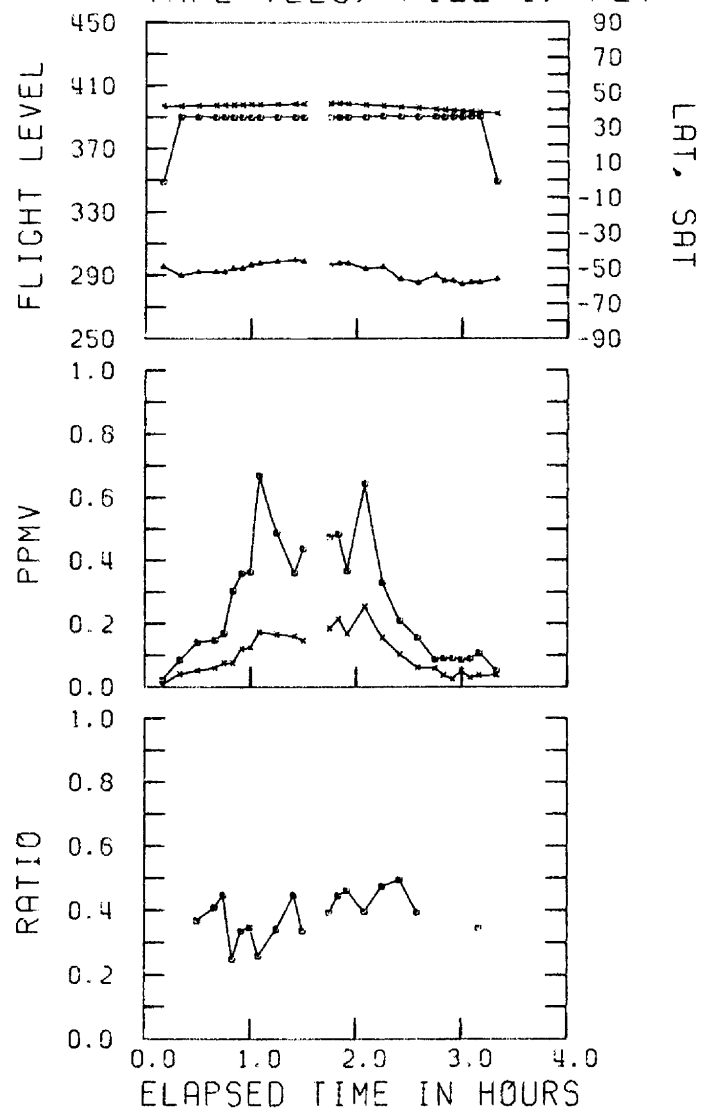


C-45

JFK TO ORD DEPARTURE 8 DEC 78
TAPE VL28, FILE 1, FLT 2

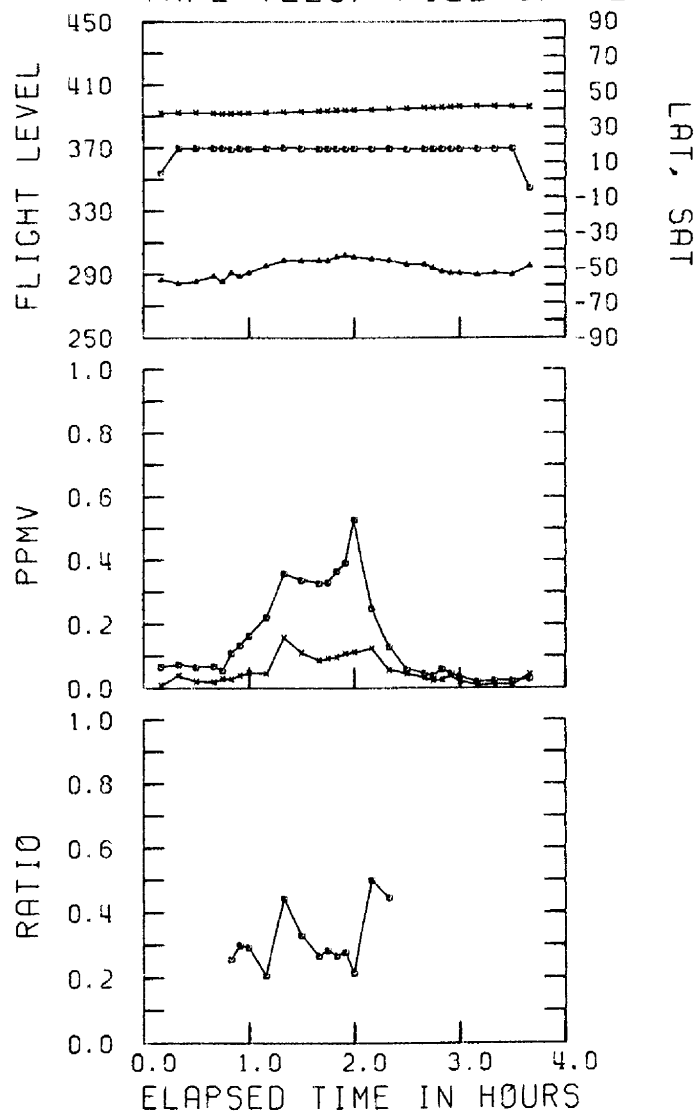


ORD TO SFO DEPARTURE 8 DEC 78
TAPE VL28, FILE 1, FLT 3

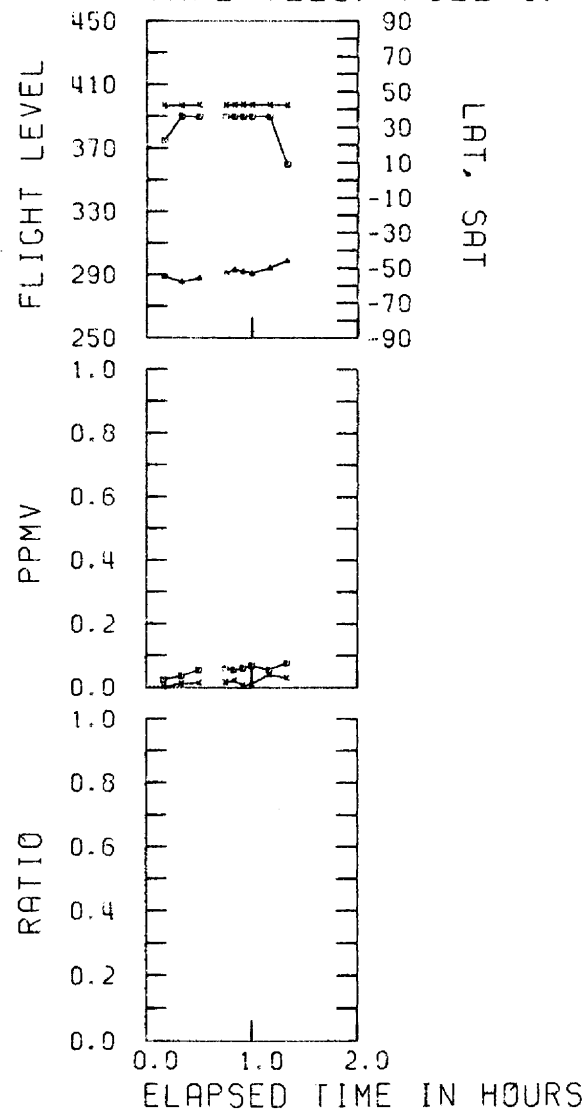


C-46

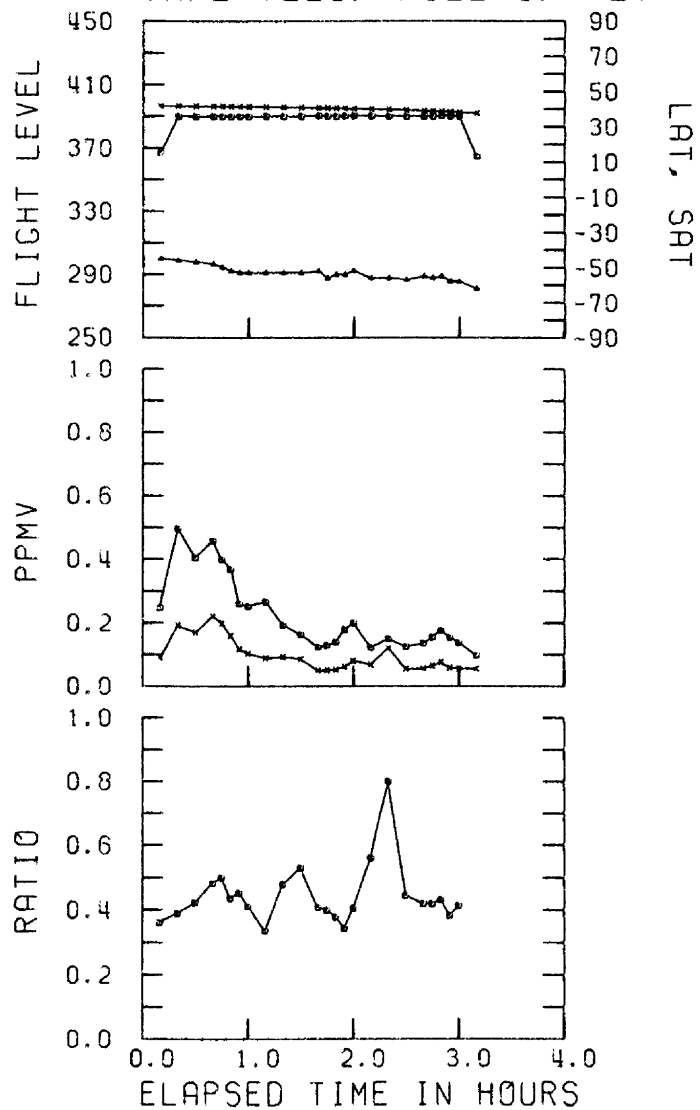
SFO TO JFK DEPARTURE 9 DEC 78
TAPE VL28, FILE 1, FLT 4



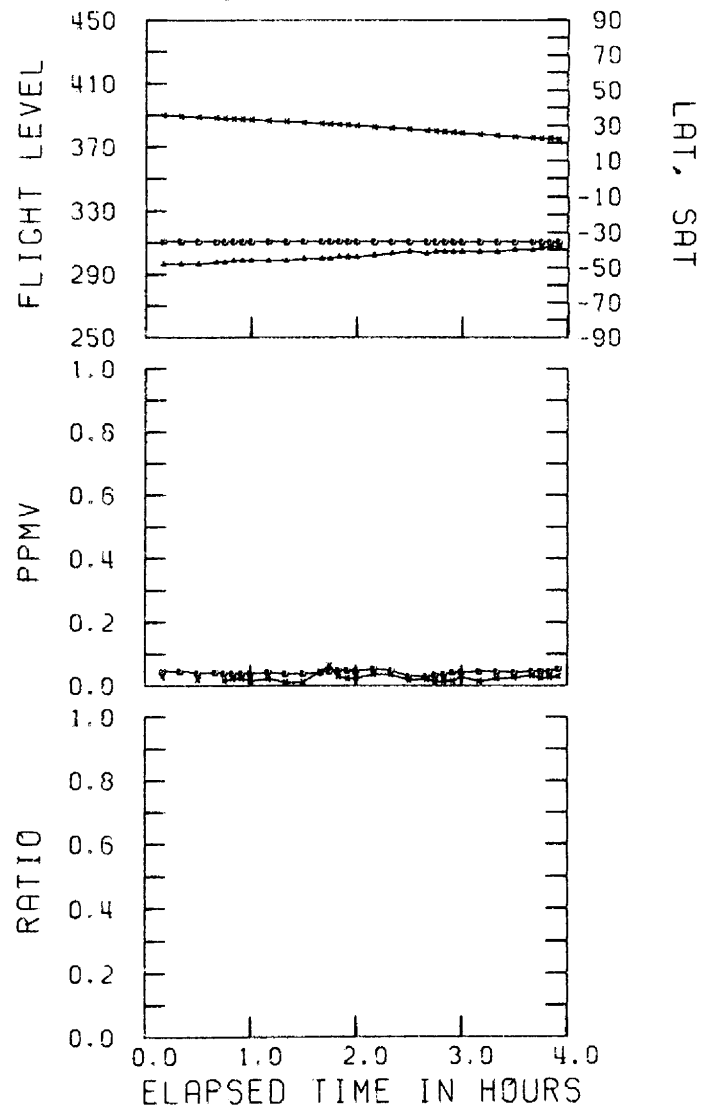
JFK TO ORD DEPARTURE 9 DEC 78
TAPE VL28, FILE 1, FLT 5



ORD TO SFO DEPARTURE 9 DEC 78
TAPE VL28, FILE 1, FLT 6



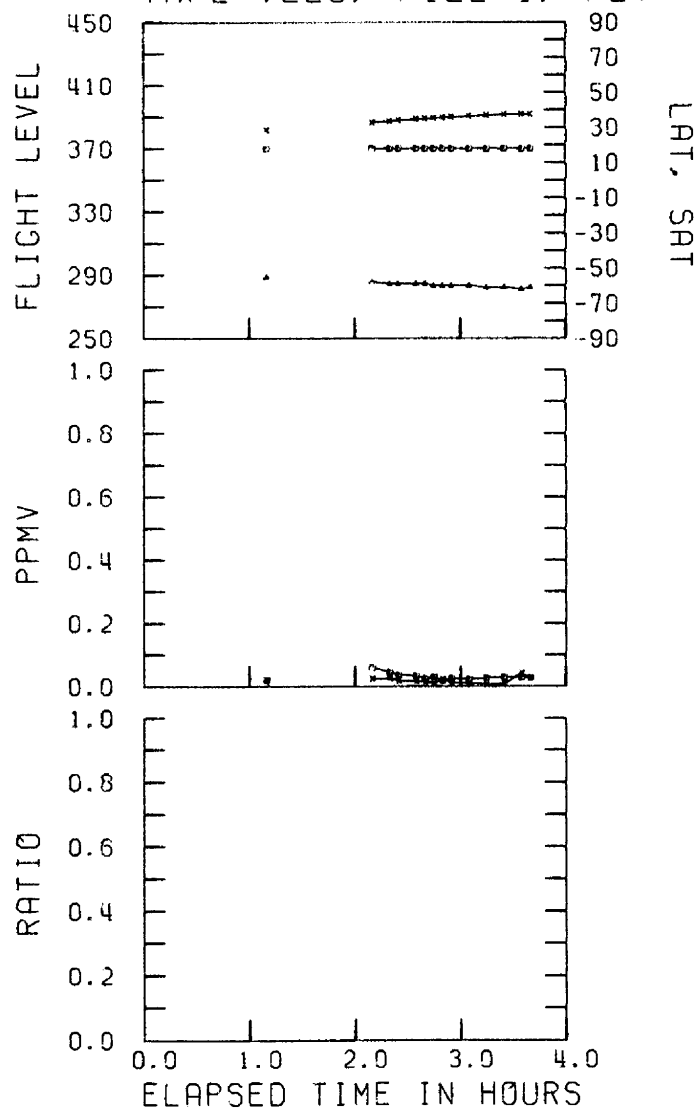
SFO TO HNL DEPARTURE 9 DEC 78
TAPE VL28, FILE 1, FLT 7



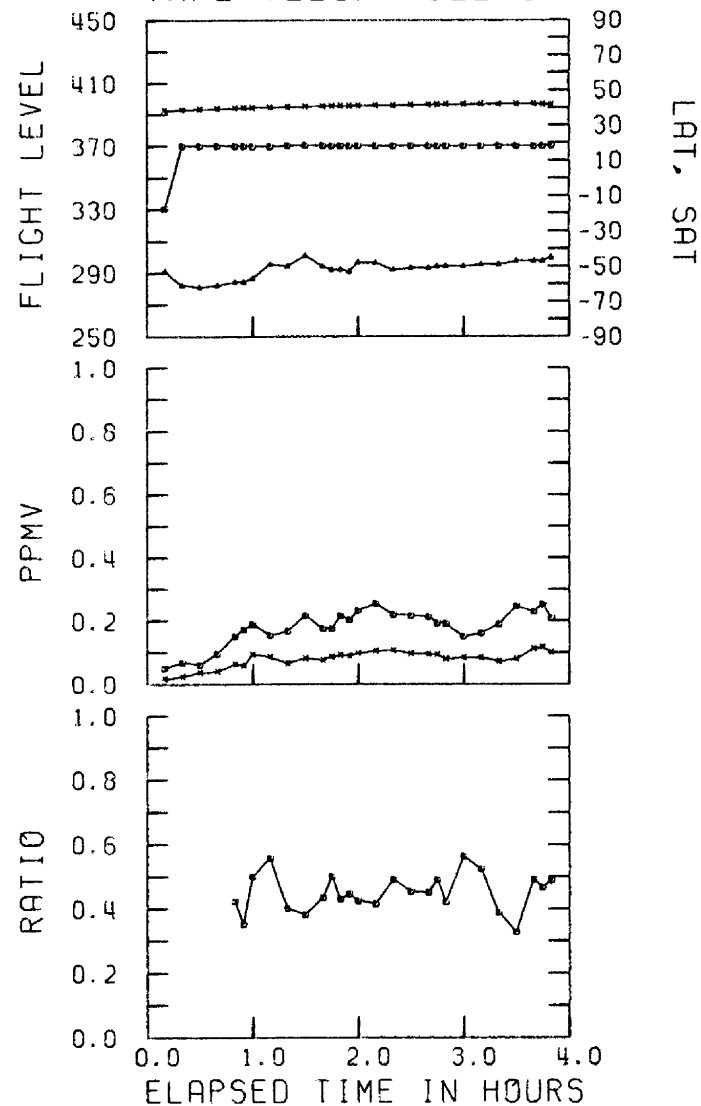
C-47

C-48

HNL TO SFO DEPARTURE 10 DEC 78
TAPE VL28, FILE 1, FLT 8

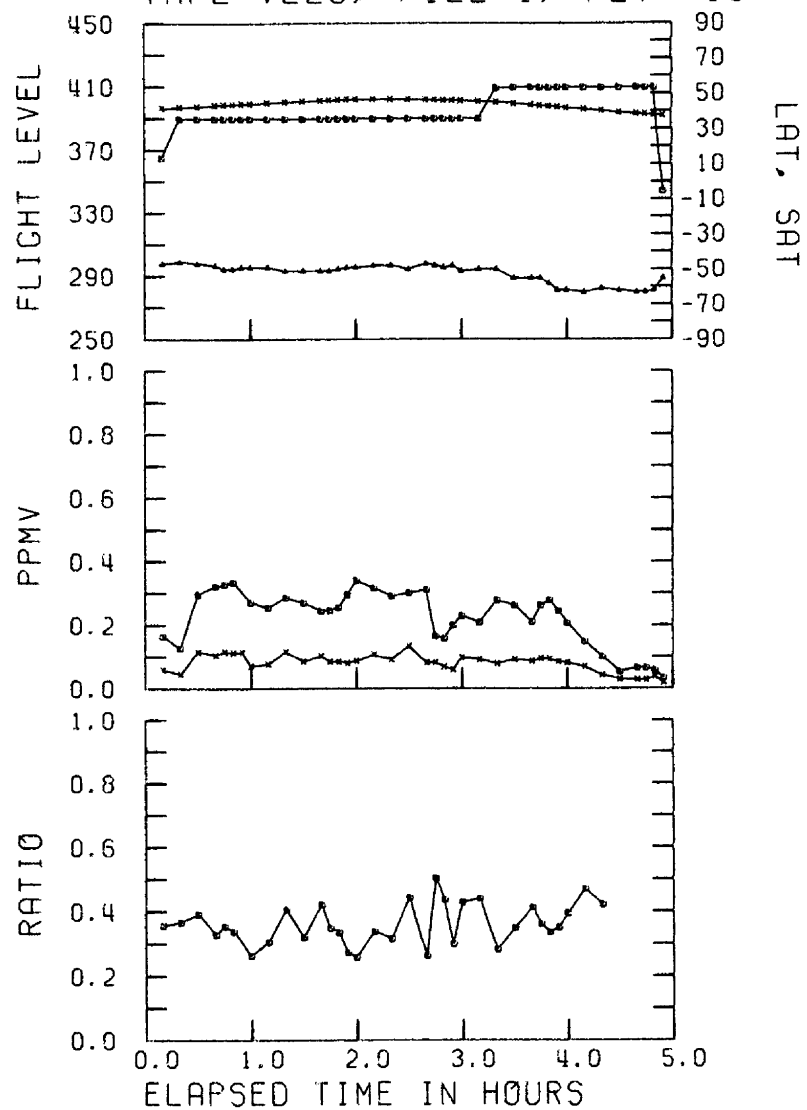


SFO TO JFK DEPARTURE 10 DEC 78
TAPE VL28, FILE 1, FLT 9

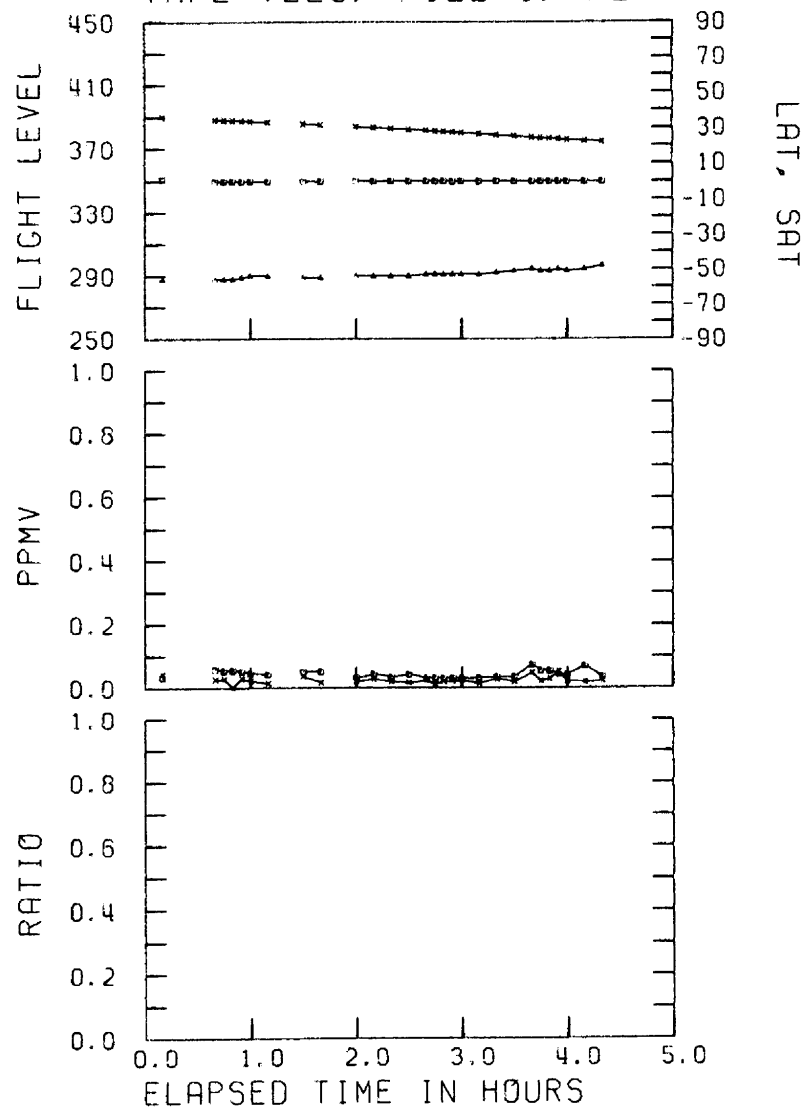


C-49

JFK TO SFO DEPARTURE 10 DEC 78
TAPE VL28, FILE 1, FLT 10

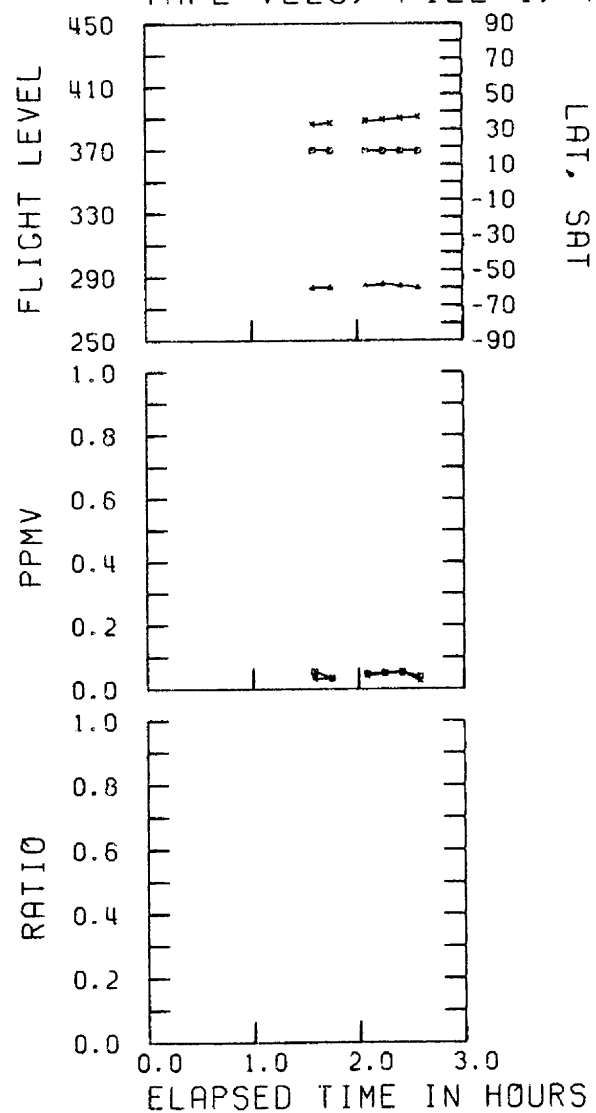


SFO TO HNL DEPARTURE 11 DEC 78
TAPE VL28, FILE 1, FLT 11

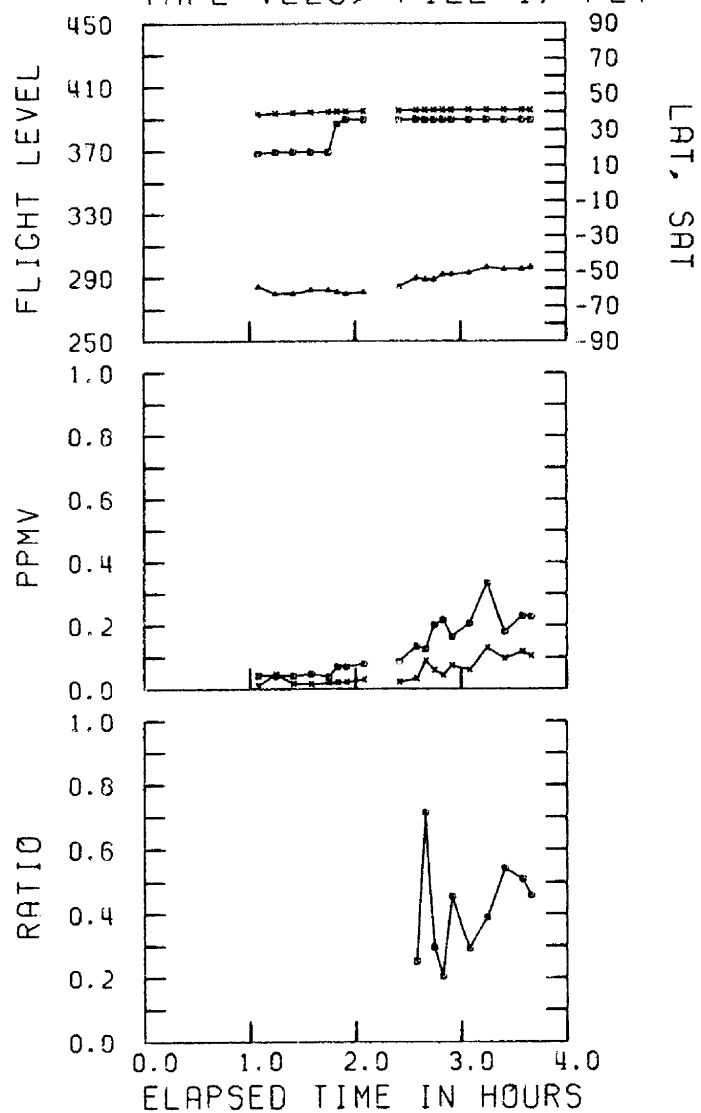


C-50

HNL TO LAX DEPARTURE 12 DEC 78
TAPE VL28, FILE 1, FLT 12

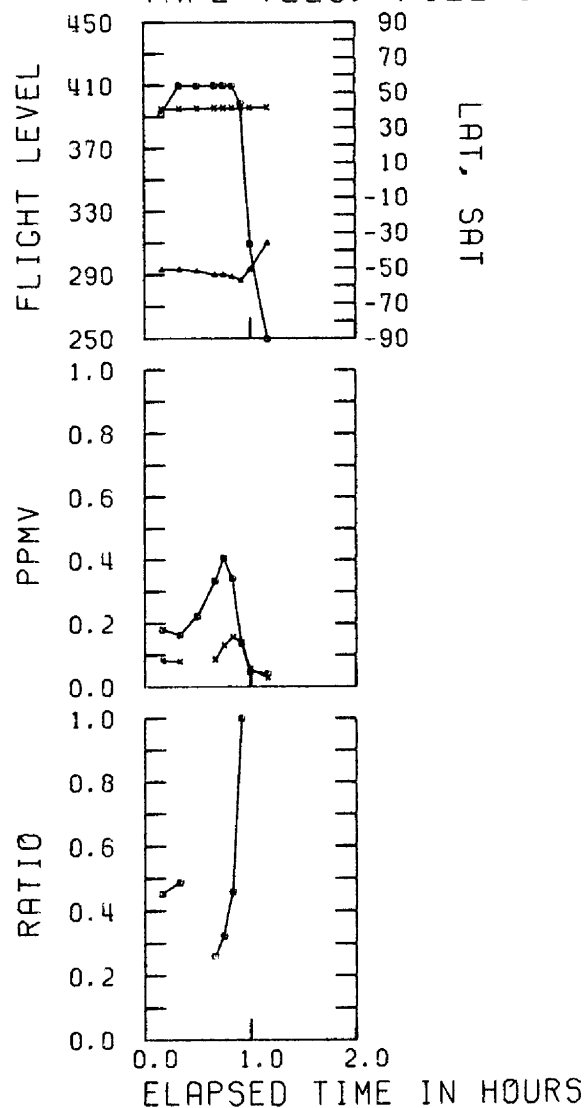


LAX TO JFK DEPARTURE 12 DEC 78
TAPE VL28, FILE 1, FLT 13

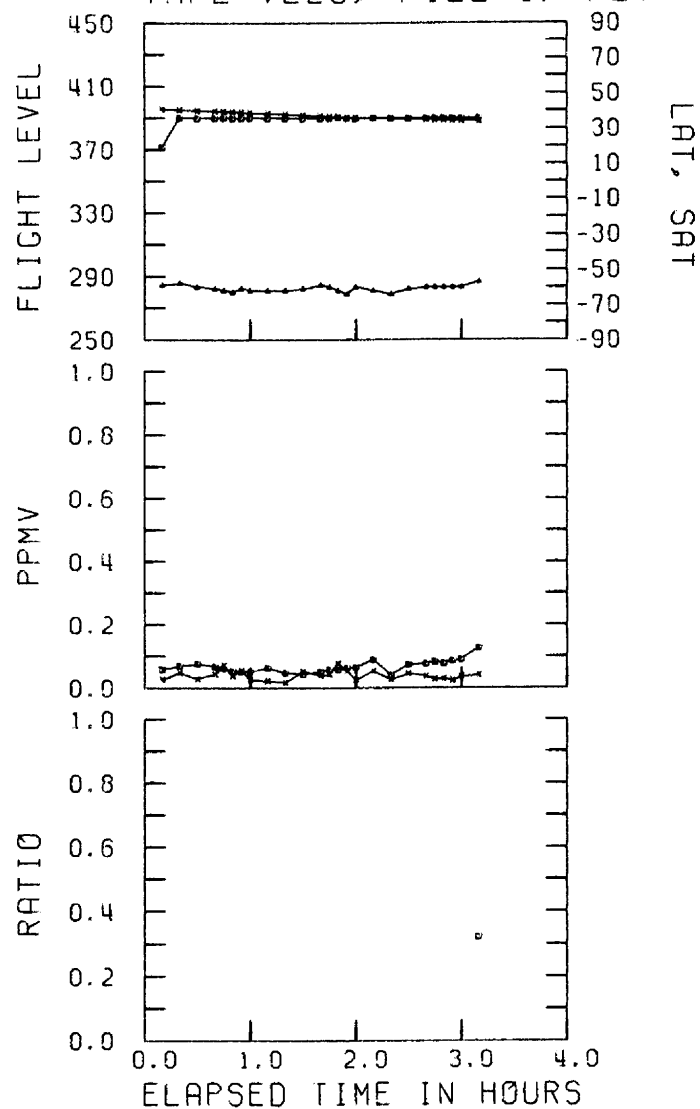


C-51

JFK TO ORD DEPARTURE 12 DEC 78
TAPE VL28, FILE 1, FLT 14

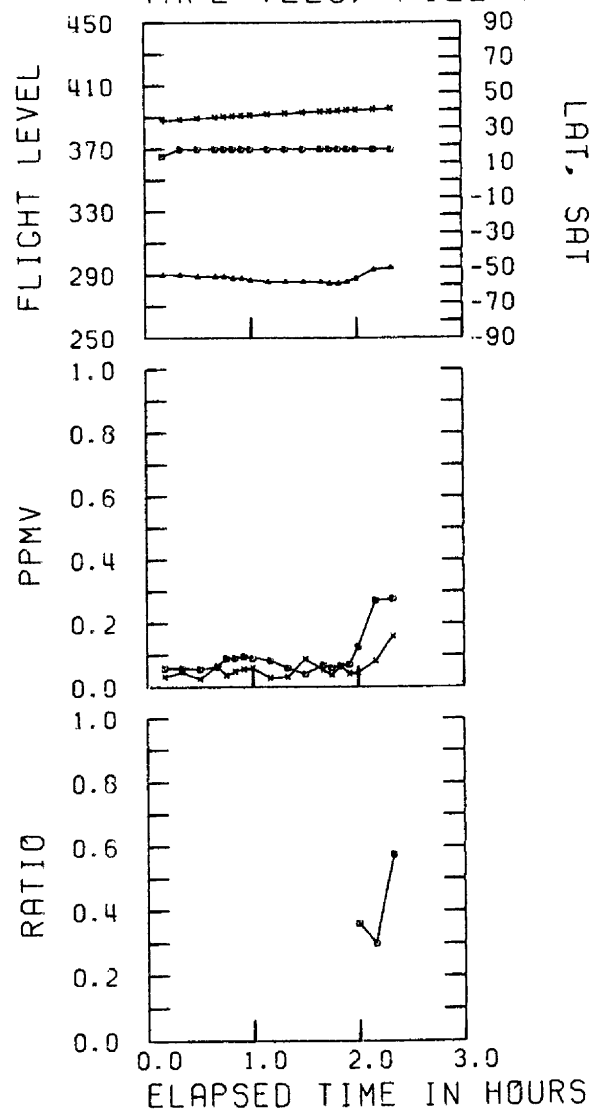


ORD TO LAX DEPARTURE 12 DEC 78
TAPE VL28, FILE 1, FLT 15

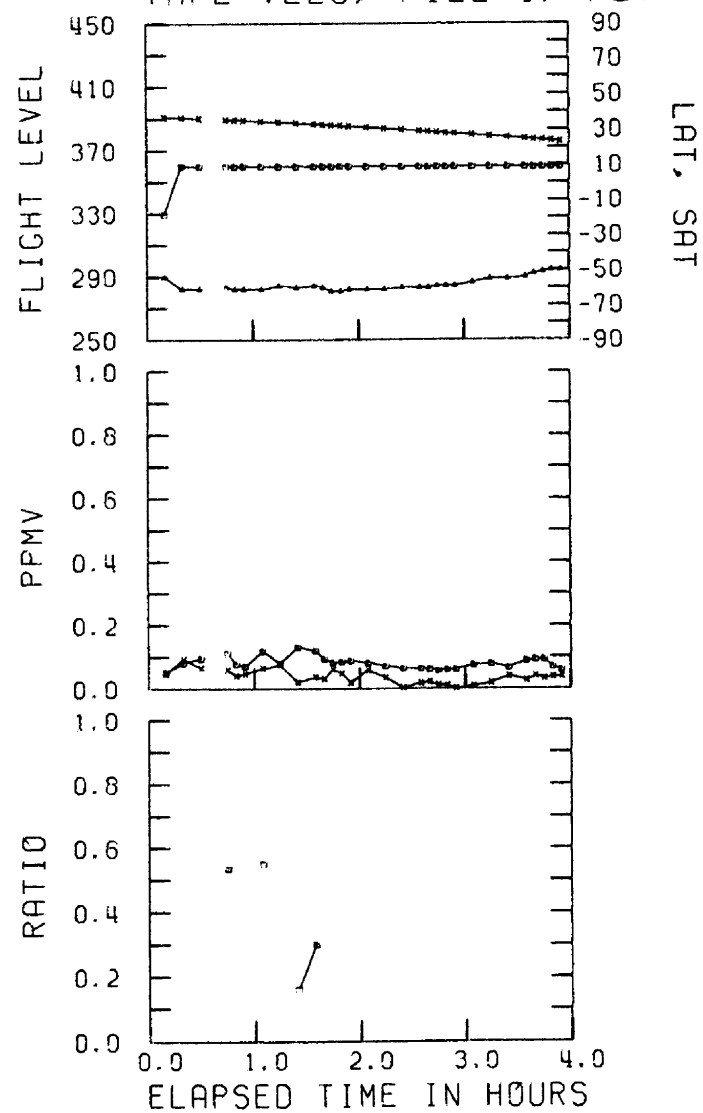


C-52

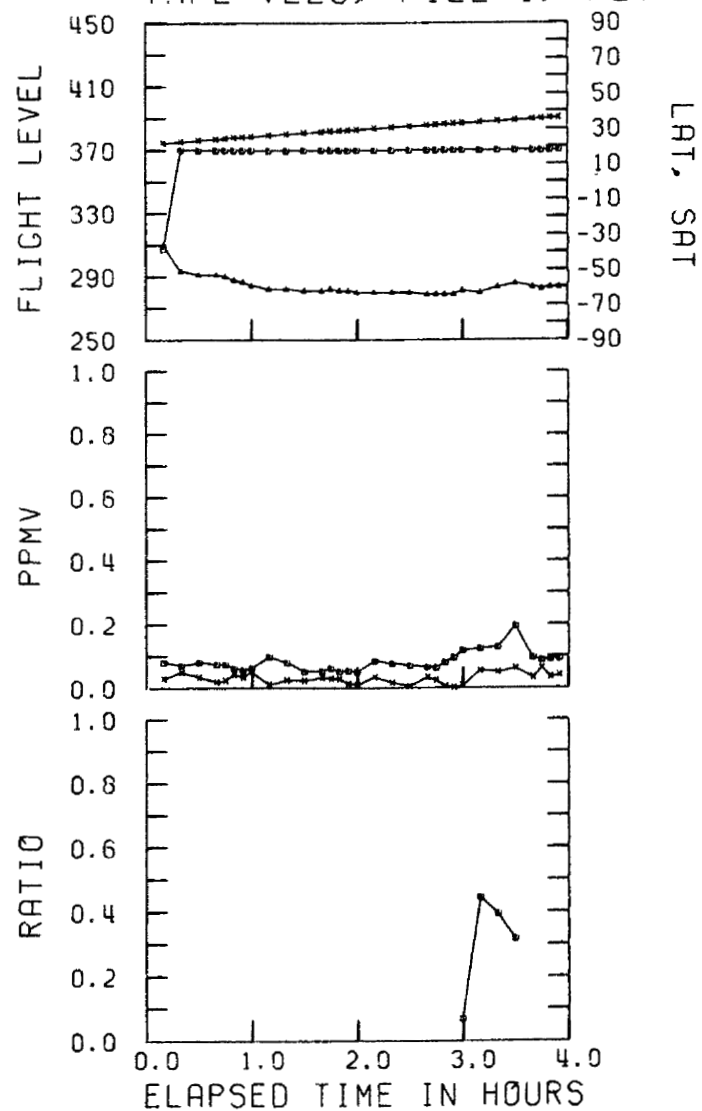
LAX TO ORD DEPARTURE 13 DEC 78
TAPE VL28, FILE 1, FLT 16



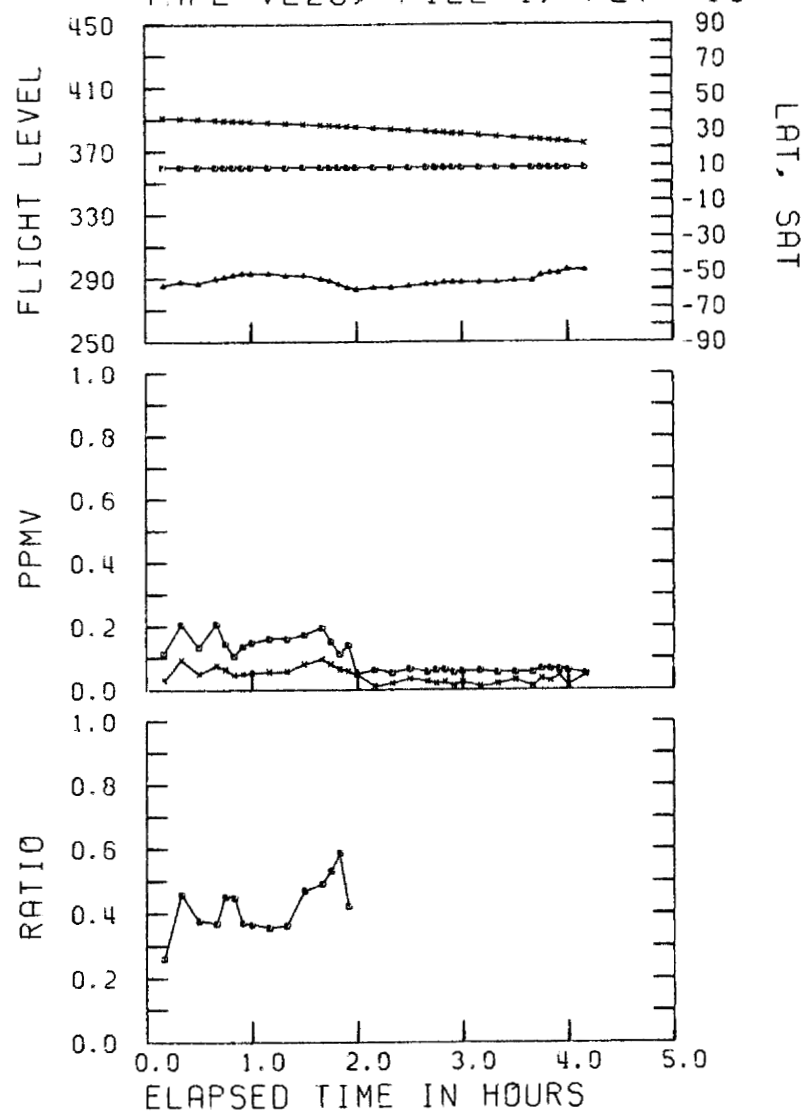
SFO TO HNL DEPARTURE 16 DEC 78
TAPE VL28, FILE 1, FLT 17



HNL TO SFO DEPARTURE 16 DEC 78
TAPE VL28, FILE 1, FLT 18

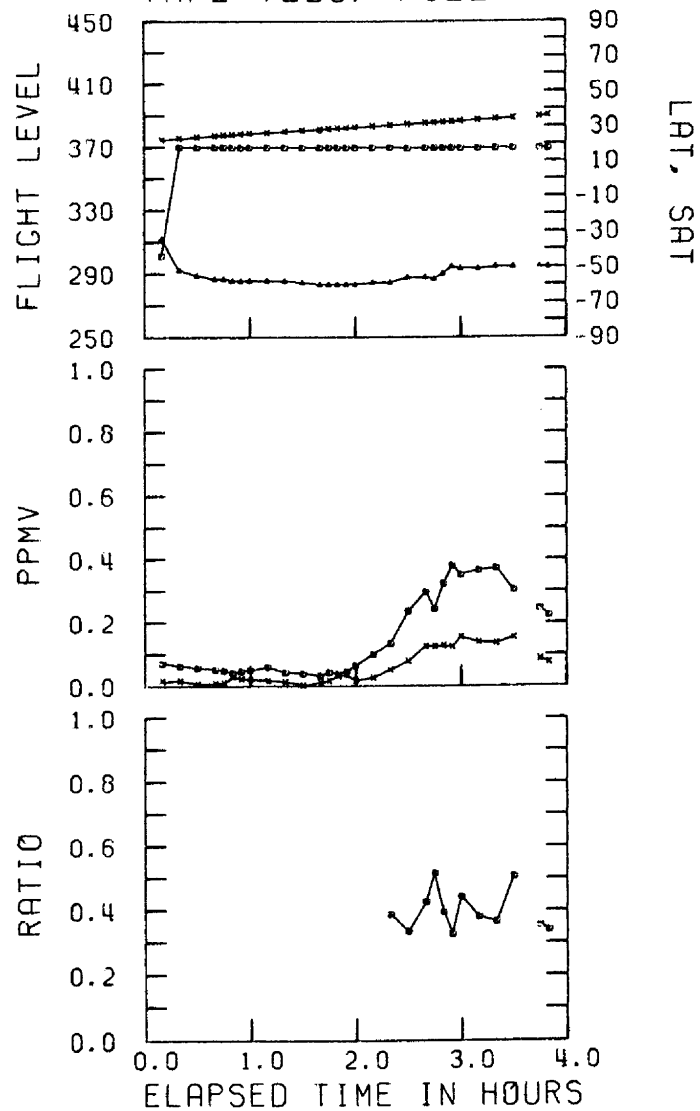


SFO TO HNL DEPARTURE 17 DEC 78
TAPE VL28, FILE 1, FLT 19

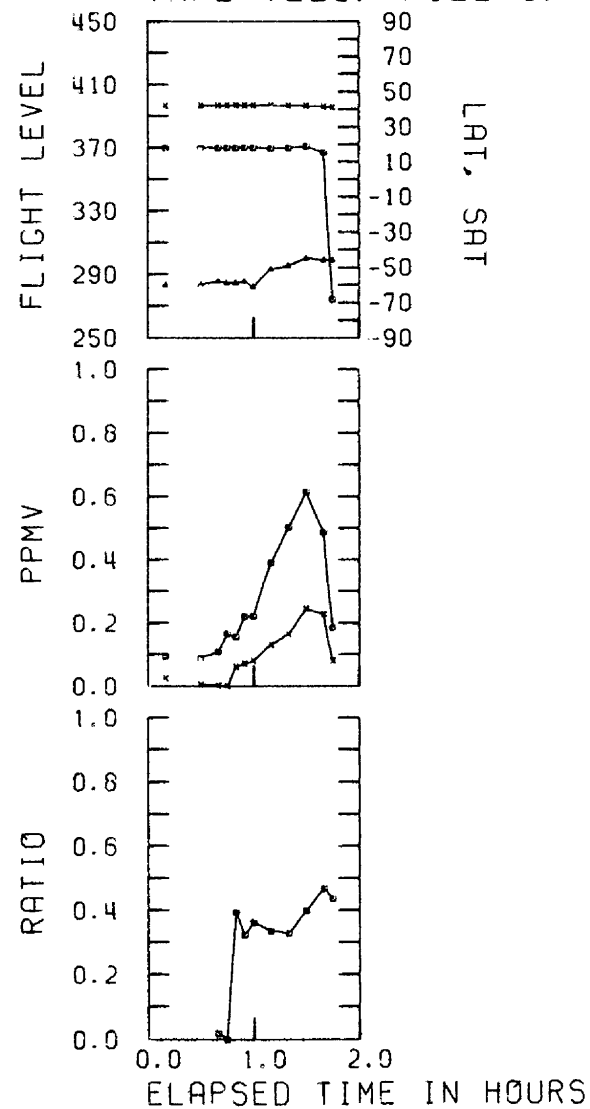


C-54

HNL TO SFO DEPARTURE 17 DEC 78
TAPE VL28, FILE 1, FLT 20

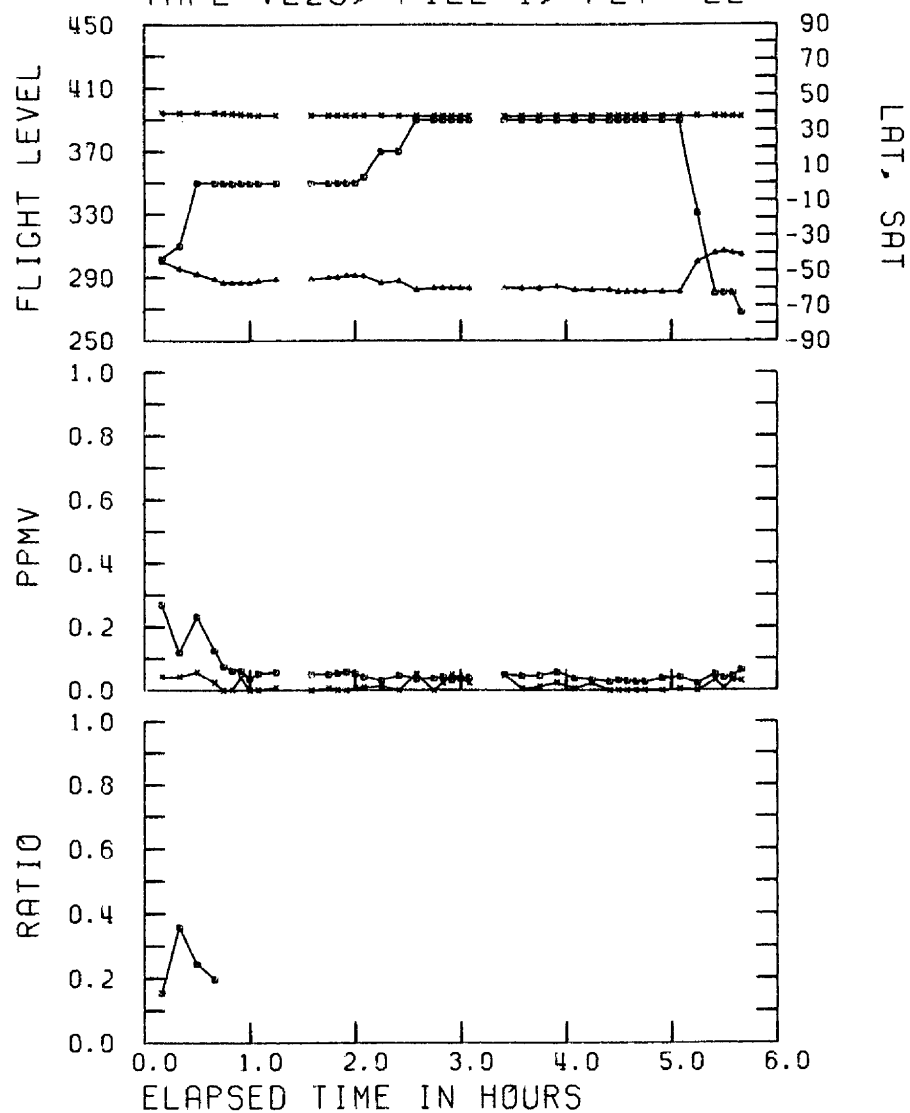


SFO TO JFK DEPARTURE 17 DEC 78
TAPE VL28, FILE 1, FLT 21

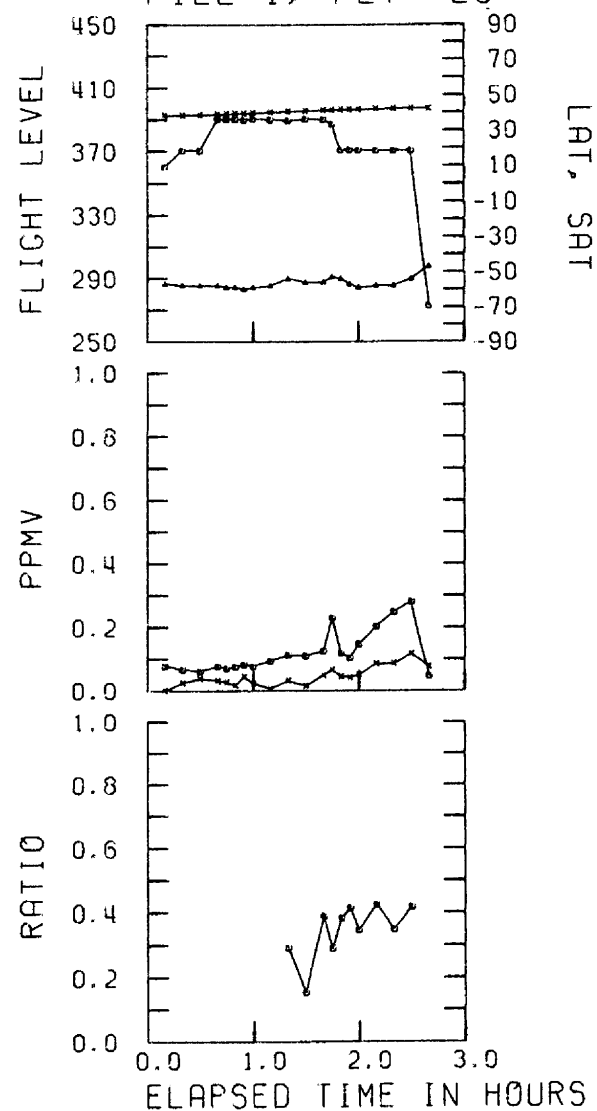


C-55

JFK TO SFO DEPARTURE 17 DEC 78
TAPE VL28, FILE 1, FLT 22

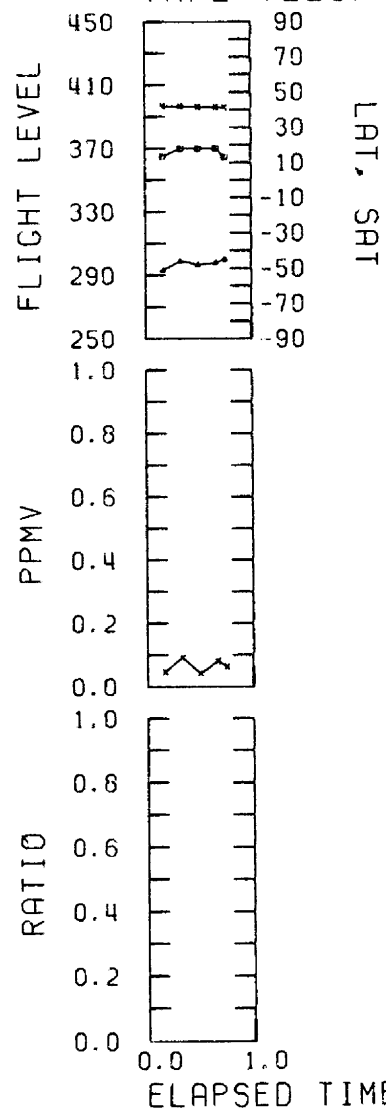


SFO TO ORD
DEPARTURE 21 DEC 78
TAPE VL28,
FILE 1, FLT 23

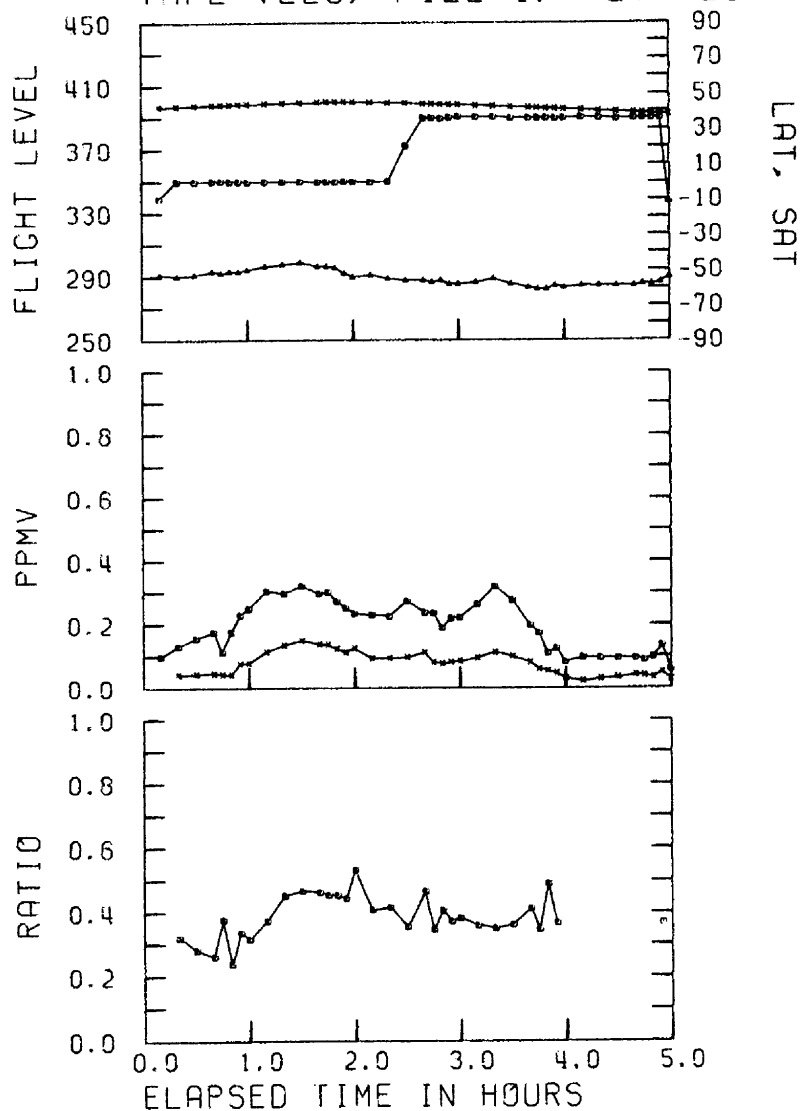


C-56

ORD TO JFK DEPARTURE 22 DEC 78
TAPE VL28, FILE 1, FLT 24

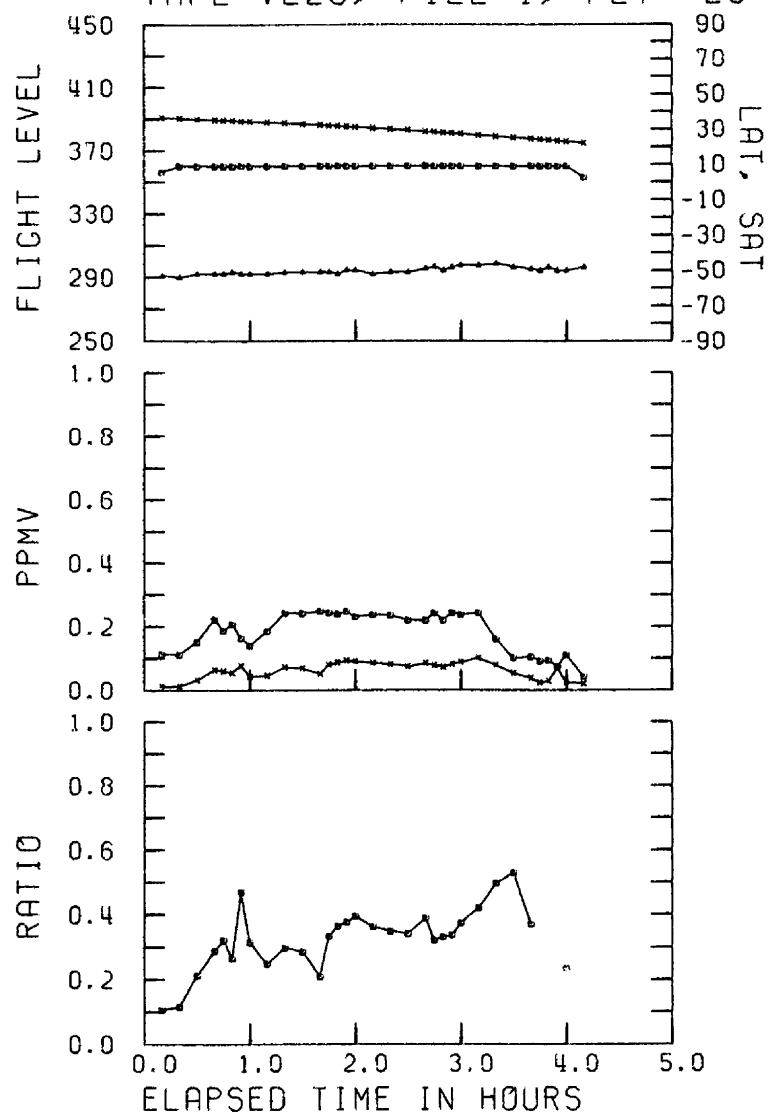


JFK TO SFO DEPARTURE 22 DEC 78
TAPE VL28, FILE 1, FLT 25

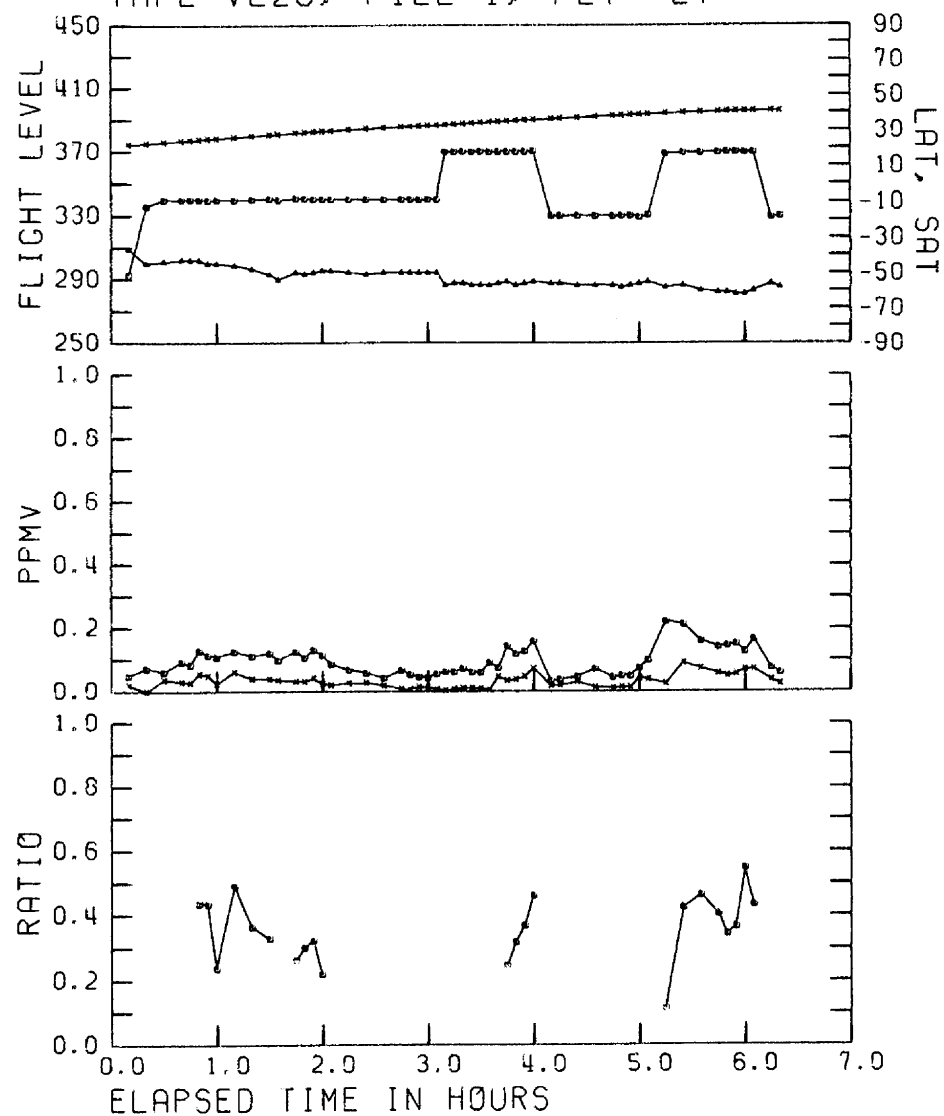


C-57

SFO TO HNL
DEPARTURE 22 DEC 78
TAPE VL28, FILE 1, FLT 26

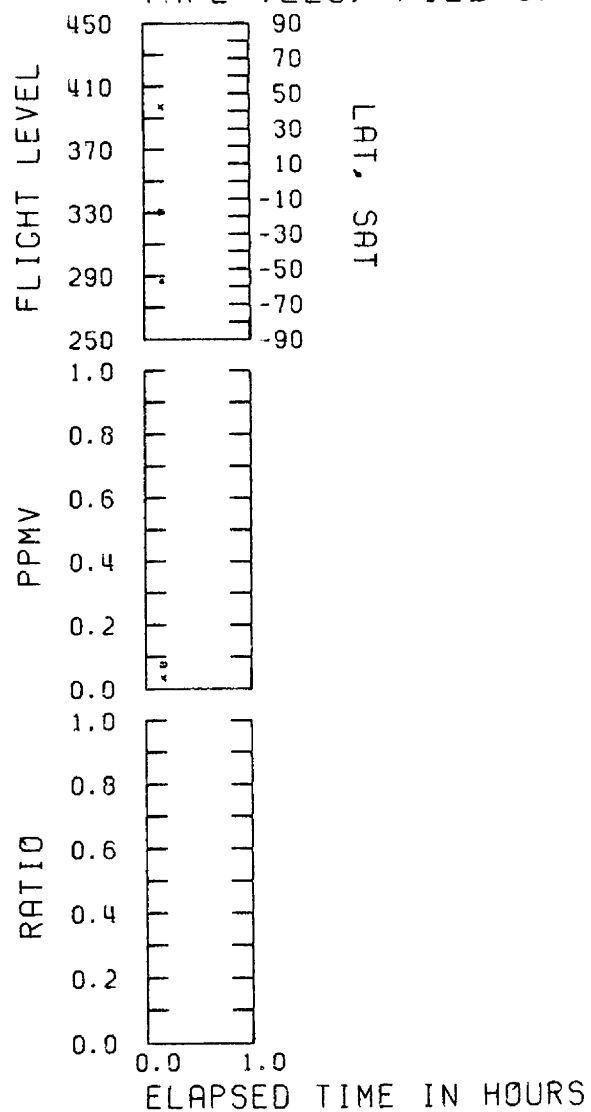


HNL TO ORD DEPARTURE 23 DEC 78
TAPE VL28, FILE 1, FLT 27

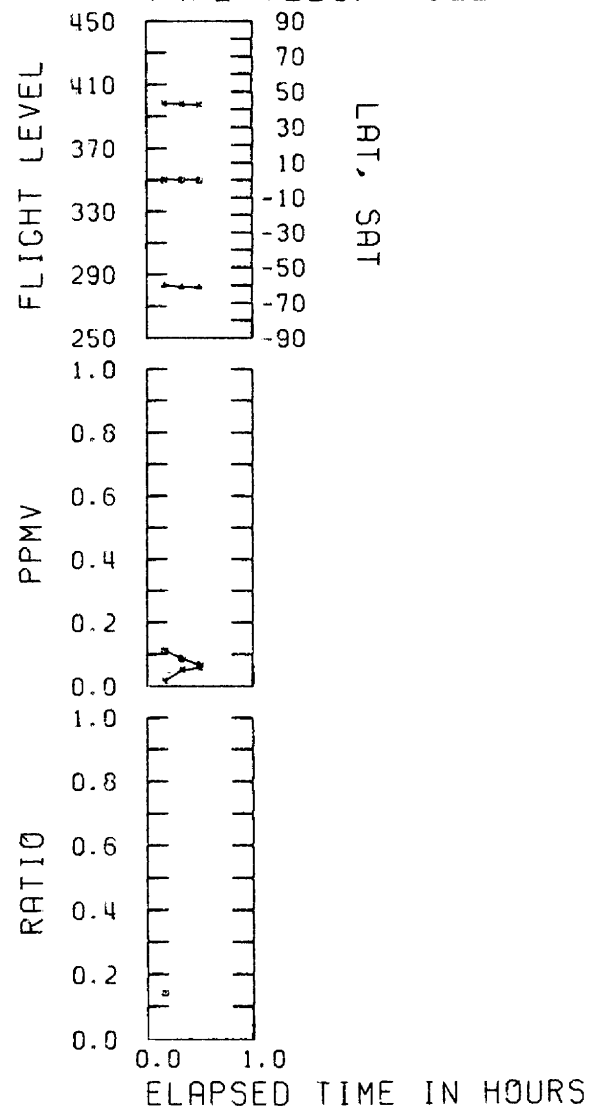


C-58

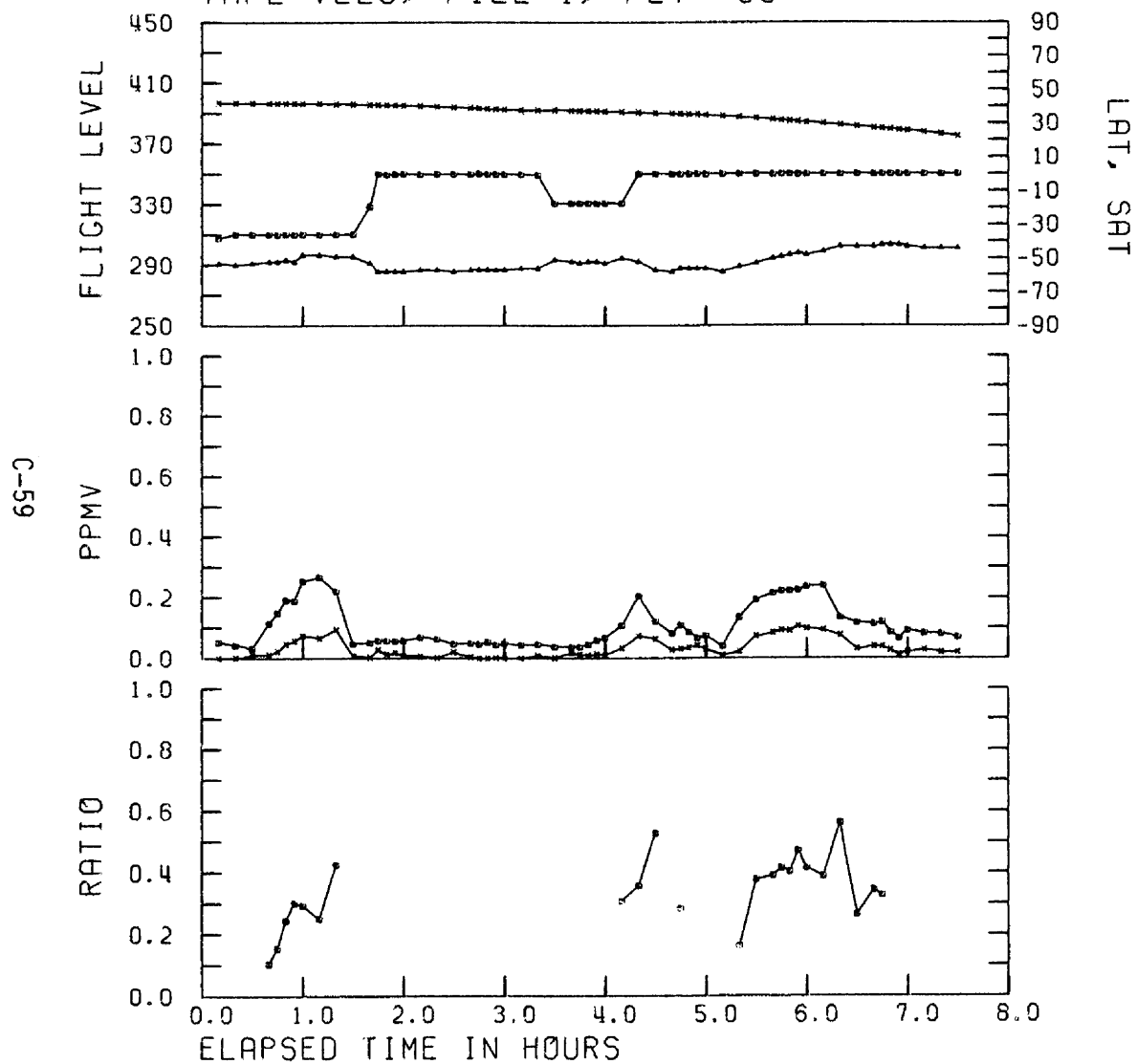
ORD TO YYZ DEPARTURE 23 DEC 78
TAPE VL28, FILE 1, FLT 28



YYZ TO ORD DEPARTURE 23 DEC 78
TAPE VL28, FILE 1, FLT 29

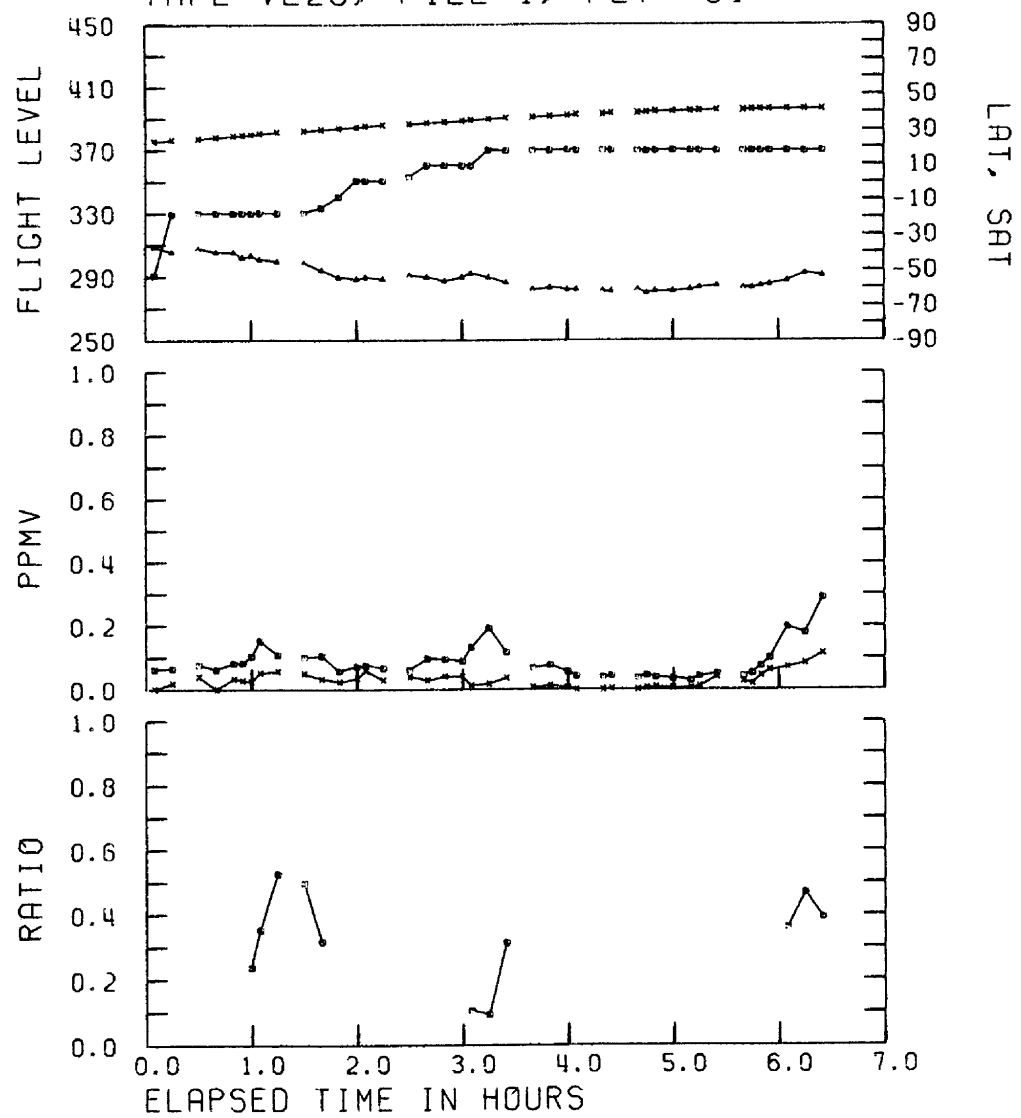


ORD TO HNL DEPARTURE 23 DEC 78
TAPE VL28, FILE 1, FLT 30



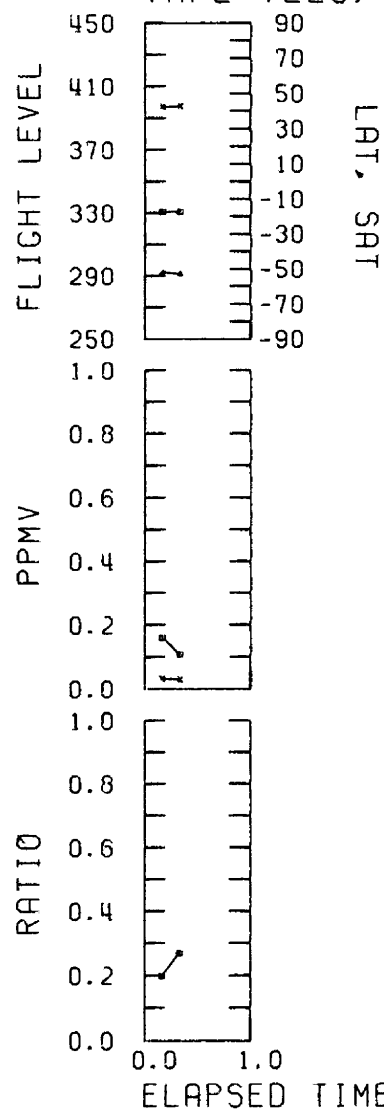
HNL TO ORD DEPARTURE 24 DEC 78
TAPE VL28, FILE 1, FLT 31

09-C

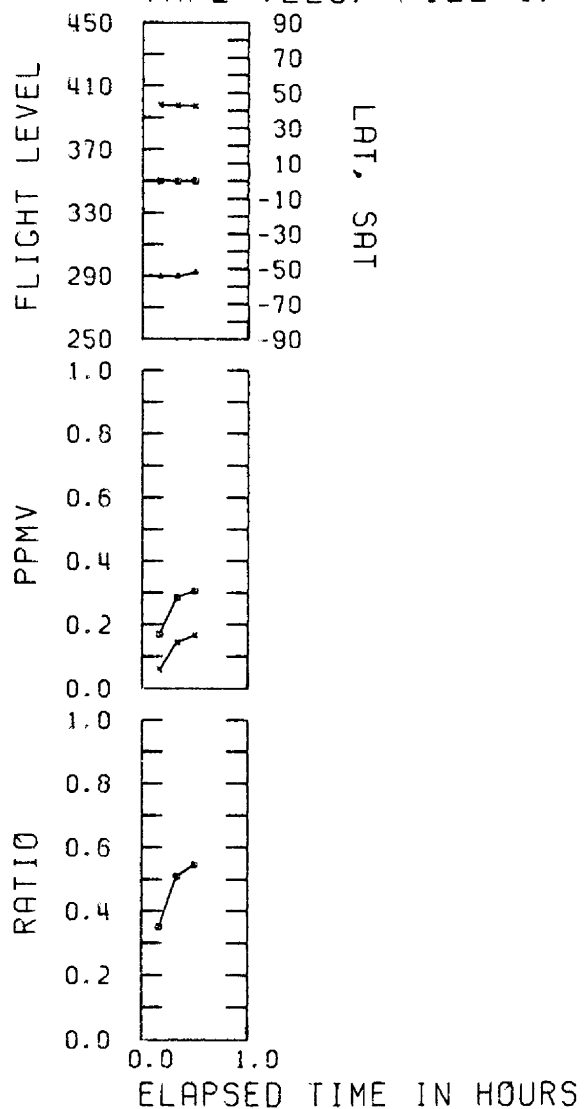


19-C

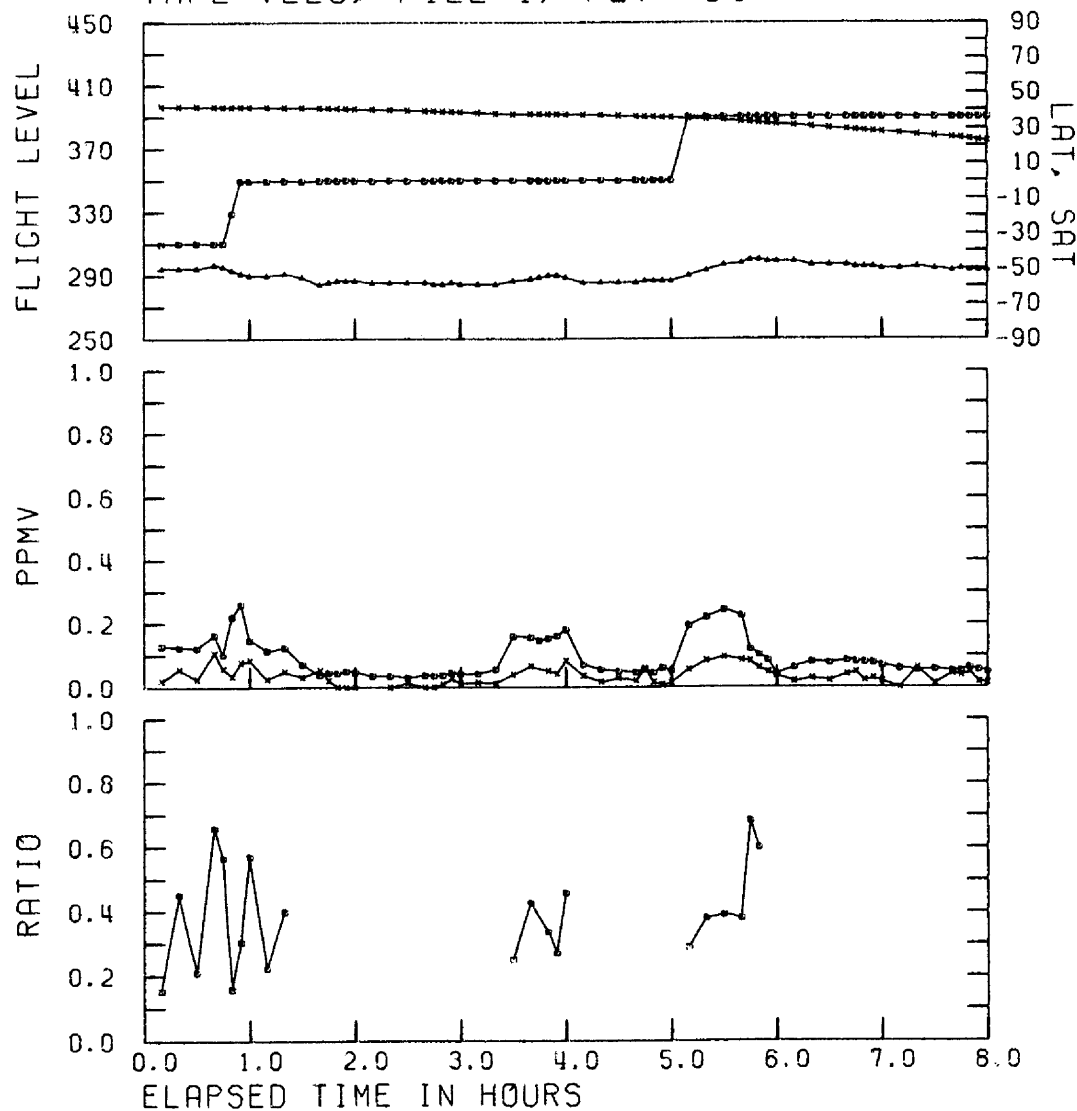
ORD TO YYZ DEPARTURE 24 DEC 78
TAPE VL28, FILE 1, FLT 32



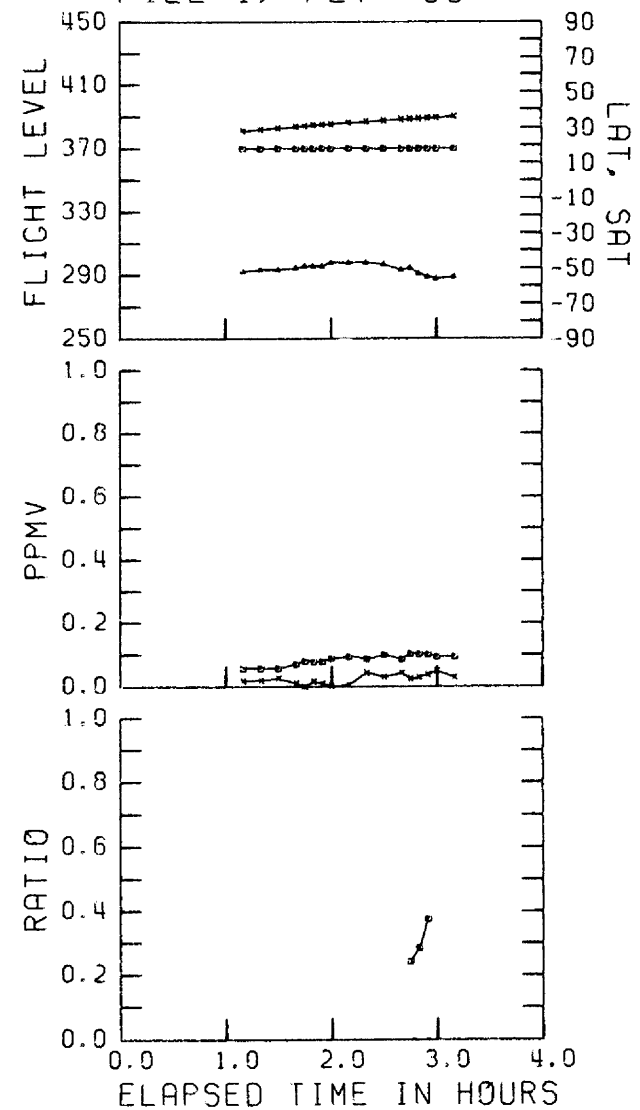
YYZ TO ORD DEPARTURE 24 DEC 78
TAPE VL28, FILE 1, FLT 33



ORD TO HNL DEPARTURE 24 DEC 78
TAPE VL28, FILE 1, FLT 34

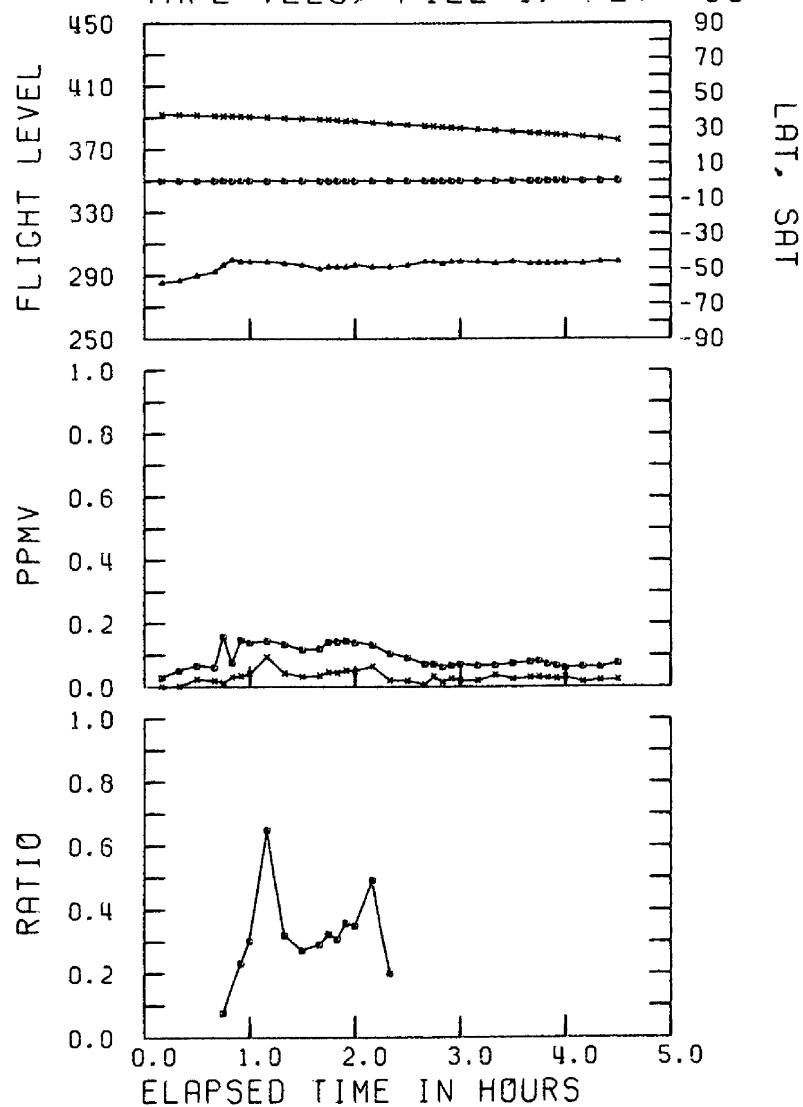


HNL TO SFO
DEPARTURE 25 DEC 78
TAPE VL28,
FILE 1, FLT 35

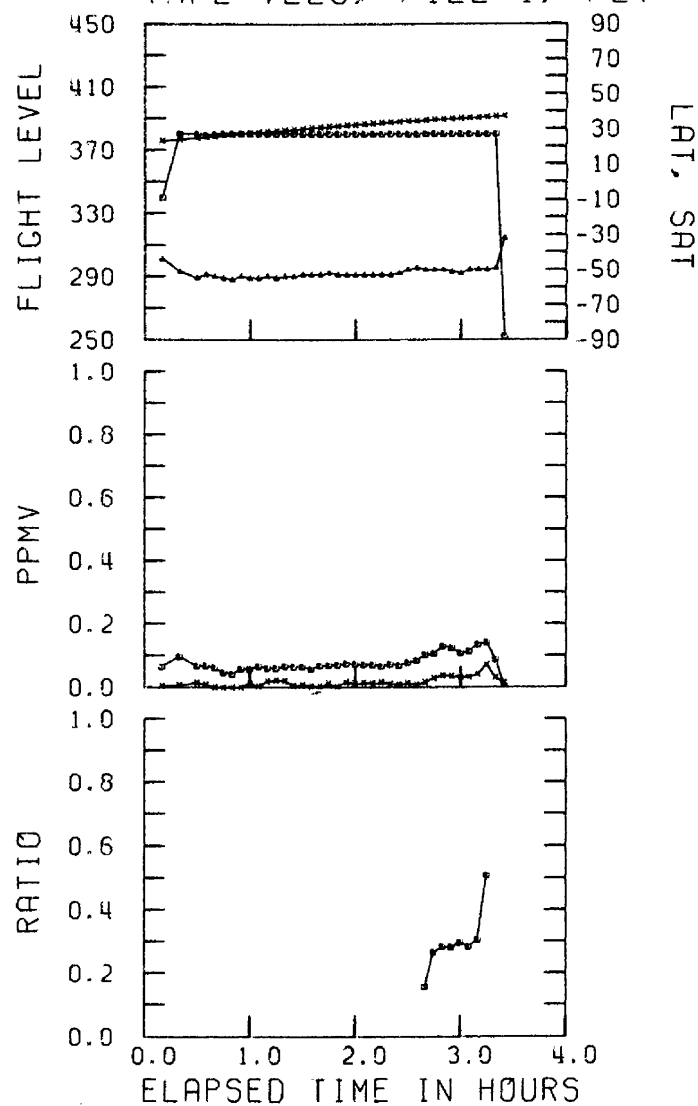


89-C

SFO TO HNL DEPARTURE 26 DEC 78
TAPE VL28, FILE 1, FLT 36

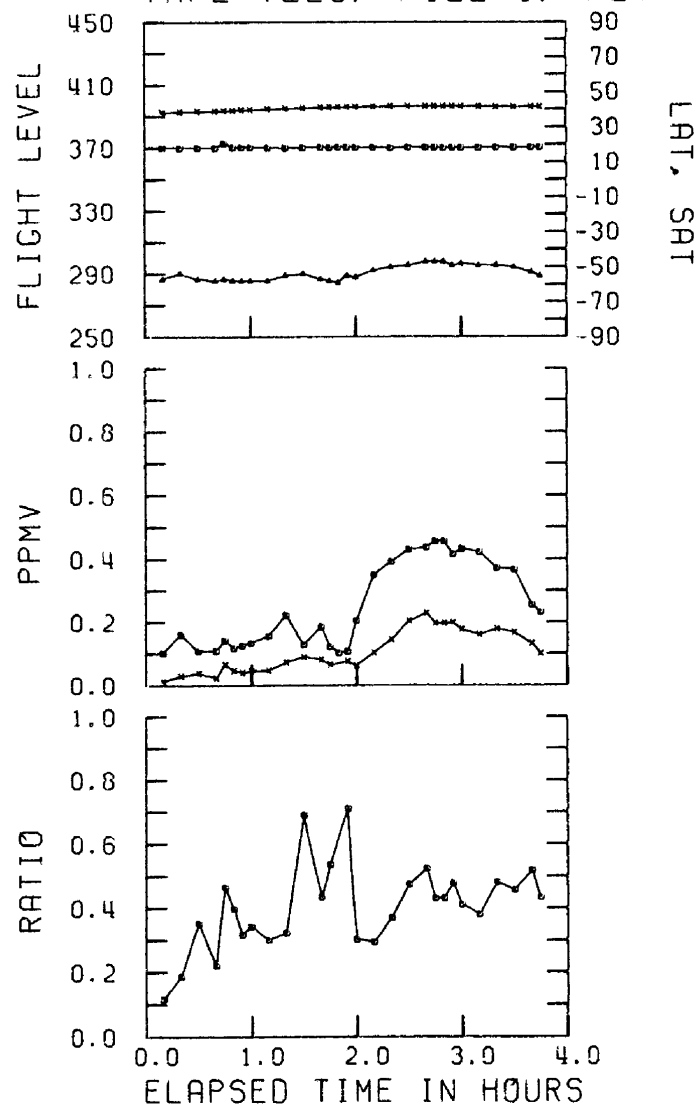


HNL TO SFO DEPARTURE 26 DEC 78
TAPE VL28, FILE 1, FLT 37

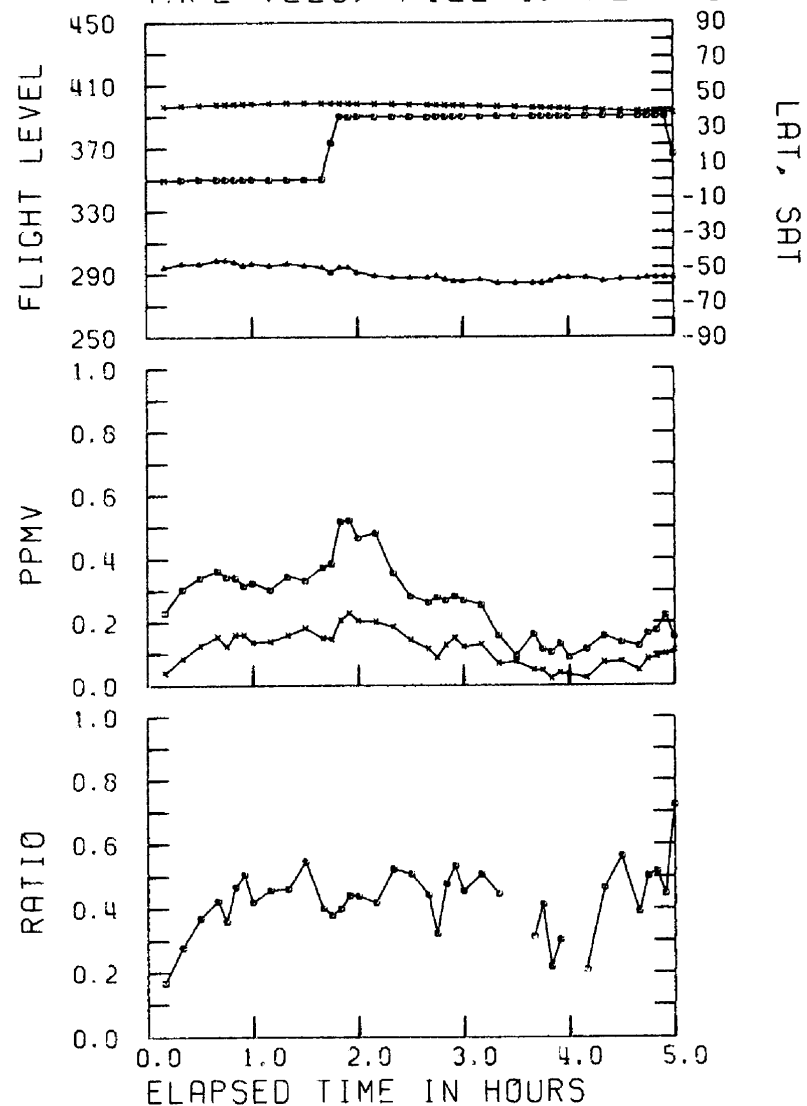


C-64

SFO TO JFK DEPARTURE 26 DEC 78
TAPE VL28, FILE 1, FLT 38

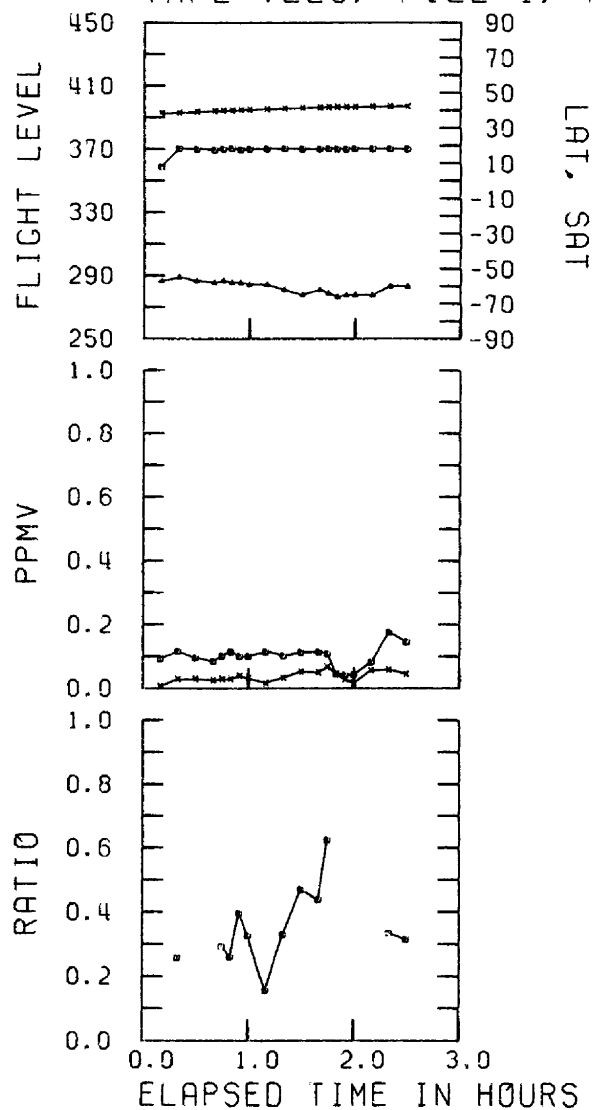


JFK TO SFO DEPARTURE 26 DEC 78
TAPE VL28, FILE 1, FLT 39

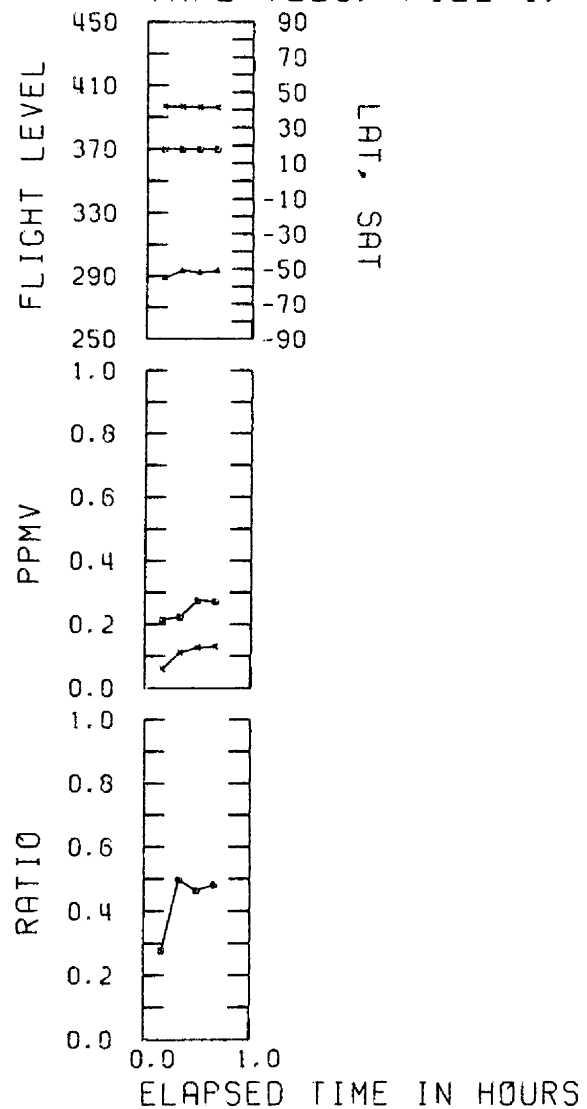


59-C

SFO TO ORD DEPARTURE 27 DEC 78
TAPE VL28, FILE 1, FLT 40

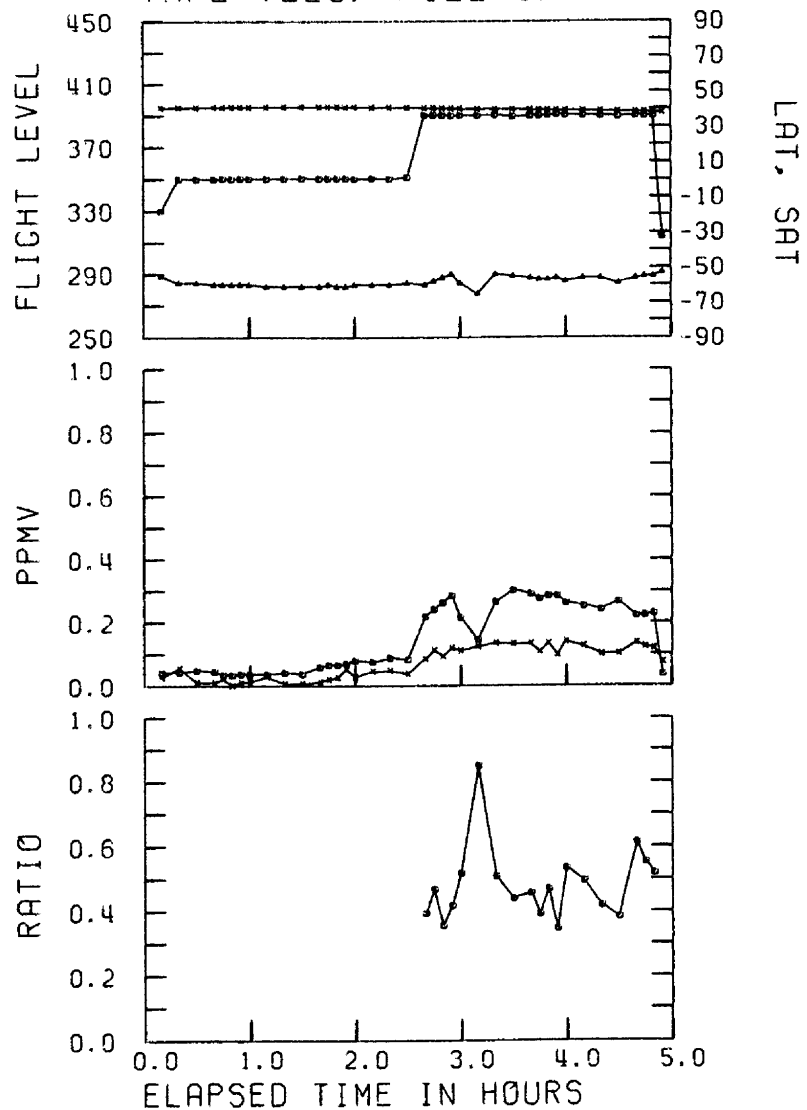


ORD TO JFK DEPARTURE 28 DEC 78
TAPE VL28, FILE 1, FLT 41

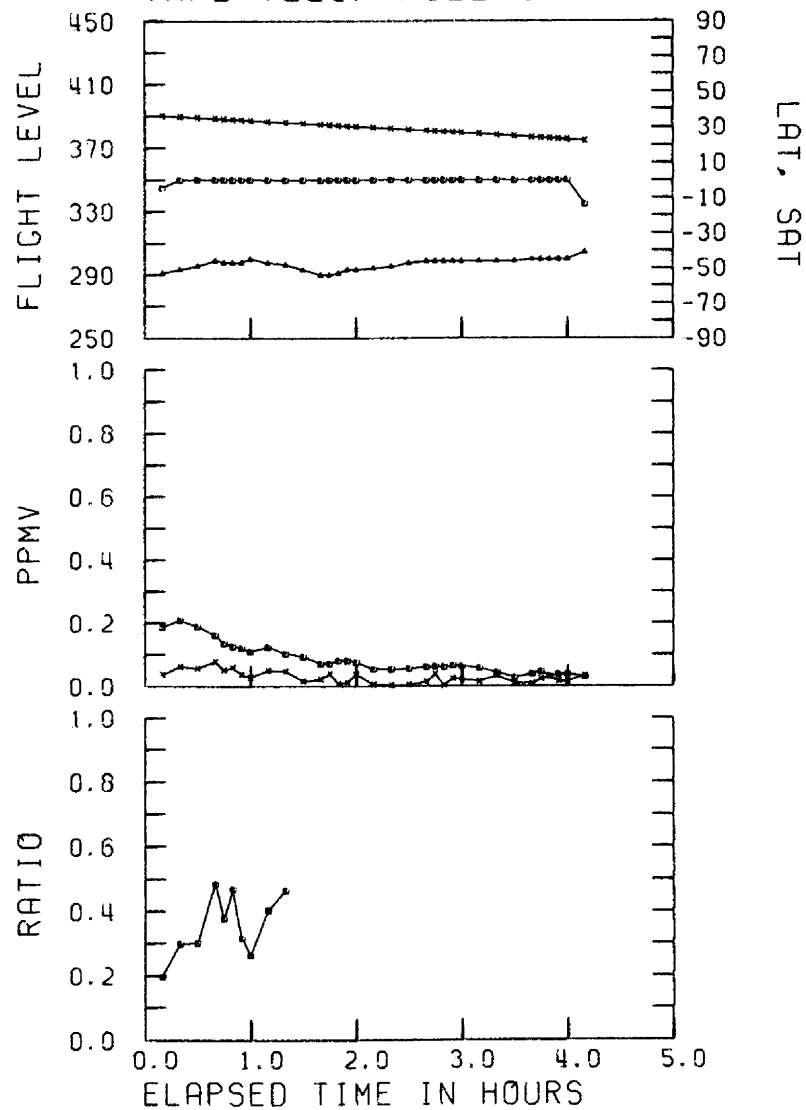


99-C

JFK TO SFO DEPARTURE 28 DEC 78
TAPE VL28, FILE 1, FLT 42

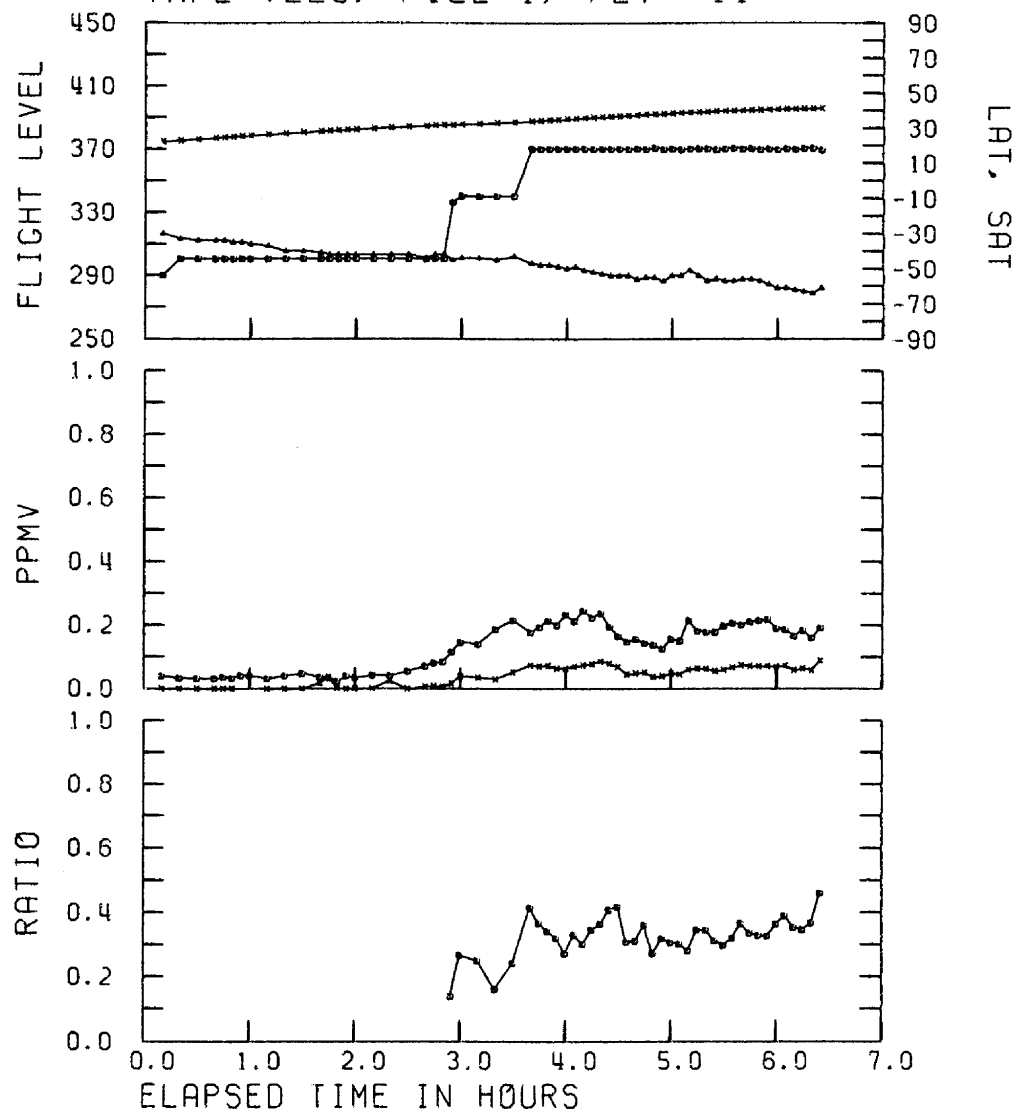


SFO TO HNL DEPARTURE 28 DEC 78
TAPE VL28, FILE 1, FLT 43

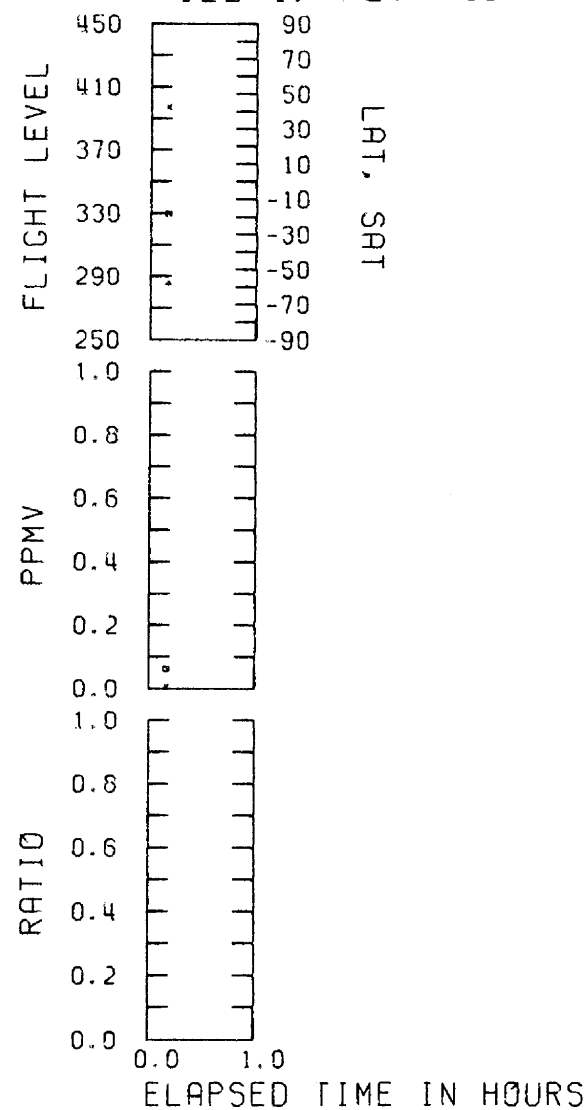


HNL TO ORD DEPARTURE 29 DEC 78
TAPE VL28, FILE 1, FLT 44

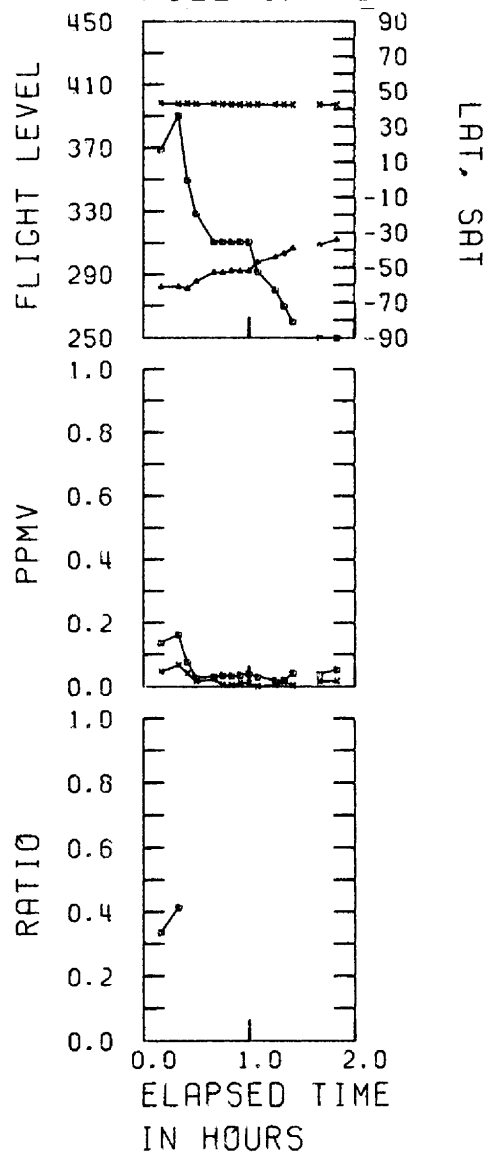
C-67



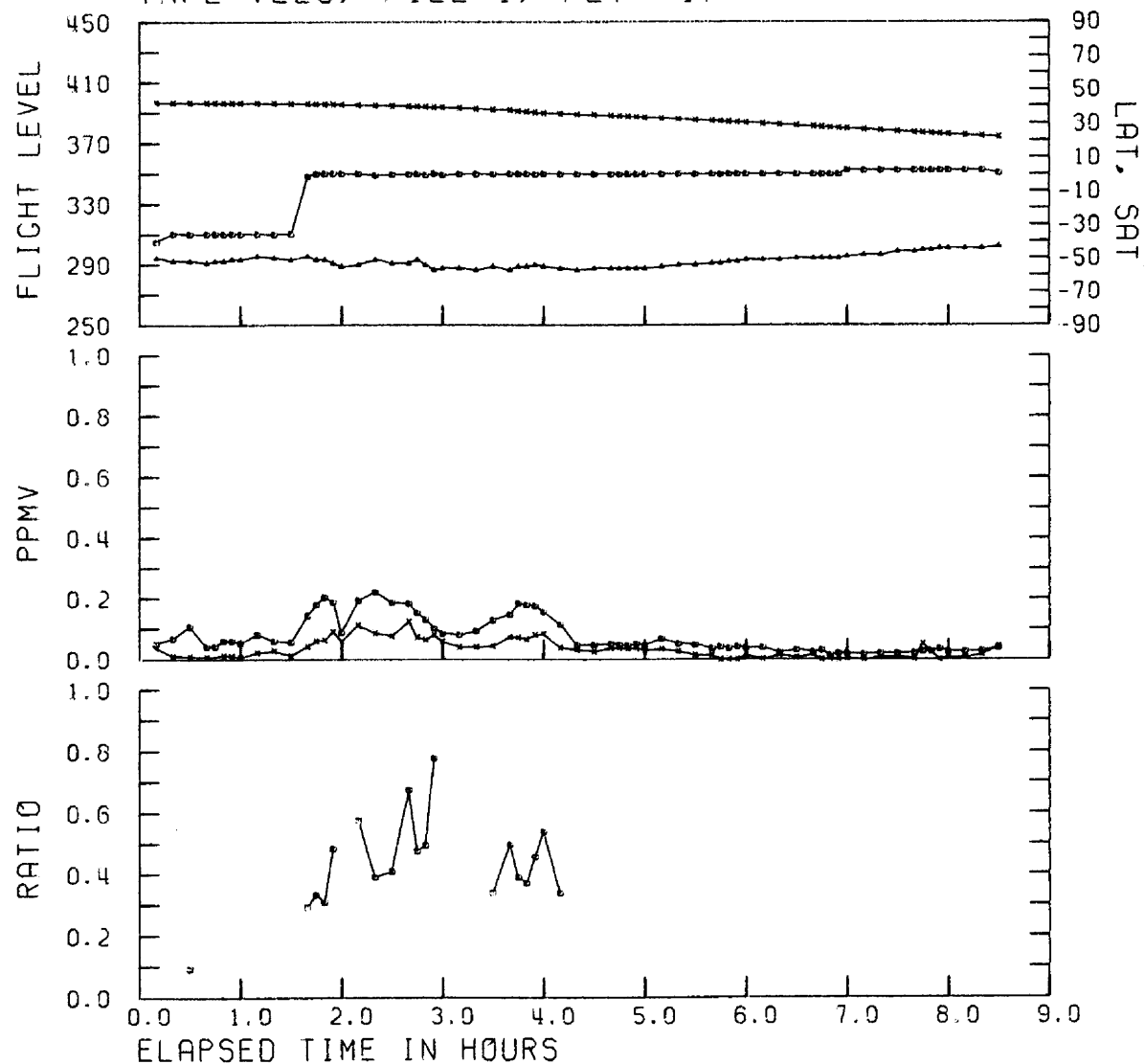
ORD TO YYZ
DEPARTURE 29 DEC 78
TAPE VL28,
FILE 1, FLT 45



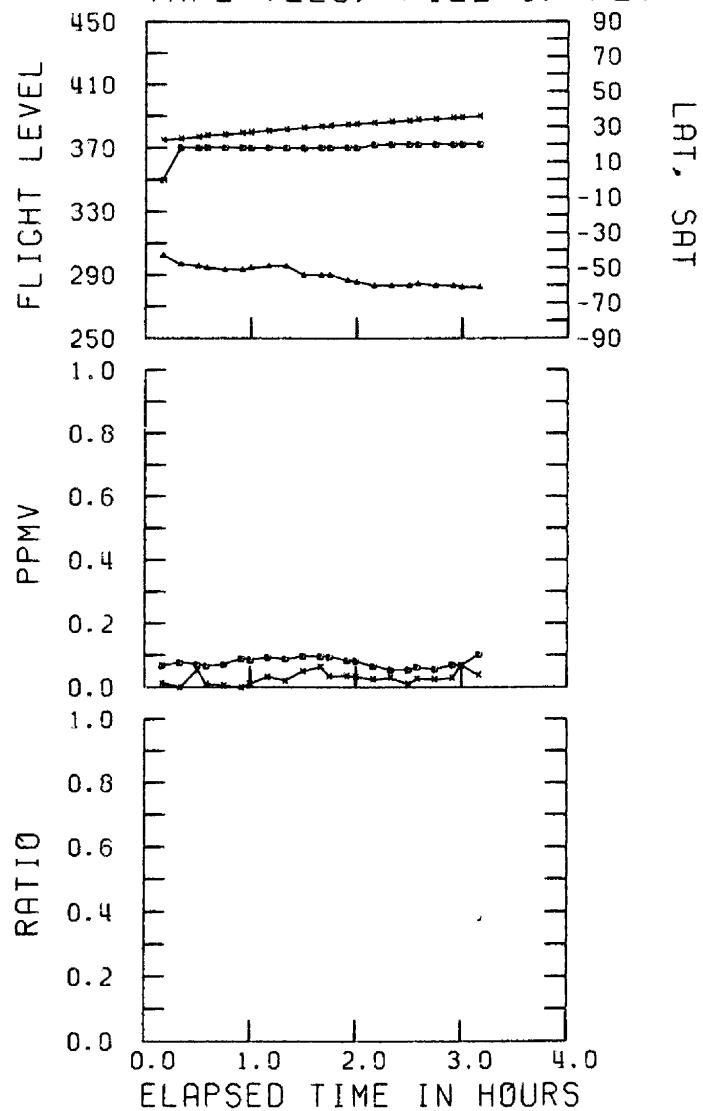
YYZ TO ORD
DEPARTURE 29 DEC 78
TAPE VL28,
FILE 1, FLT 46



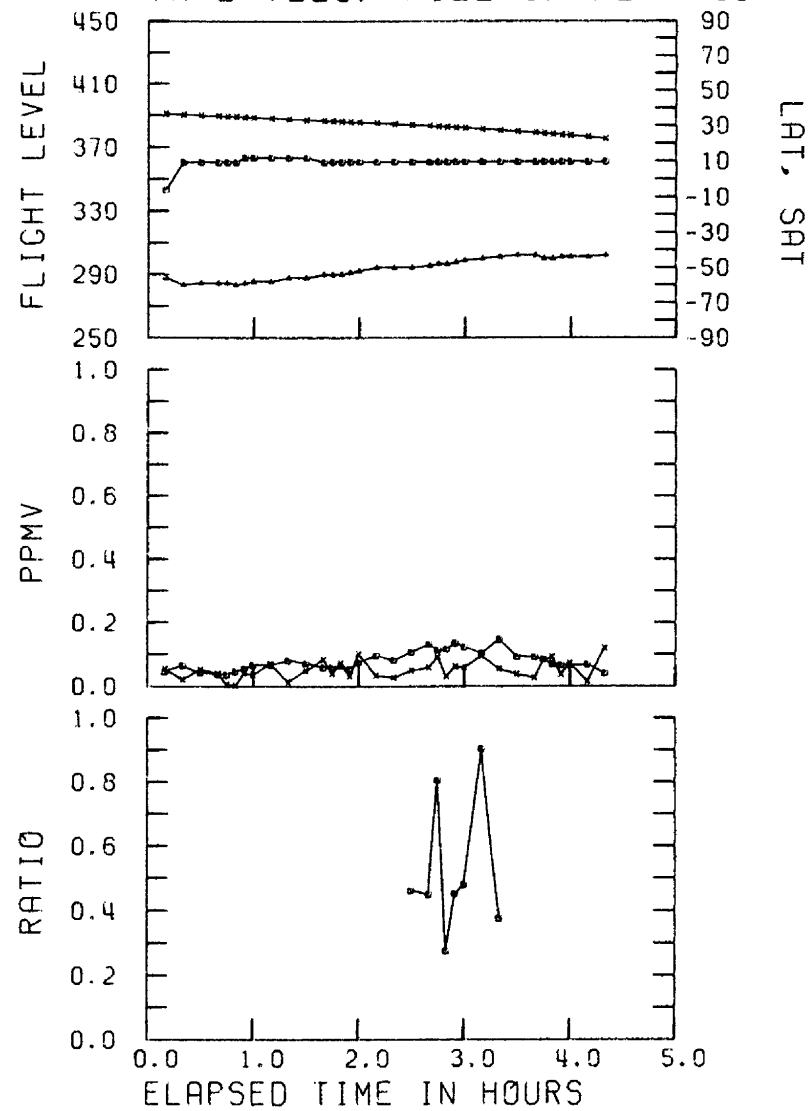
ORD TO HNL DEPARTURE 29 DEC 78
TAPE VL28, FILE 1, FLT 47



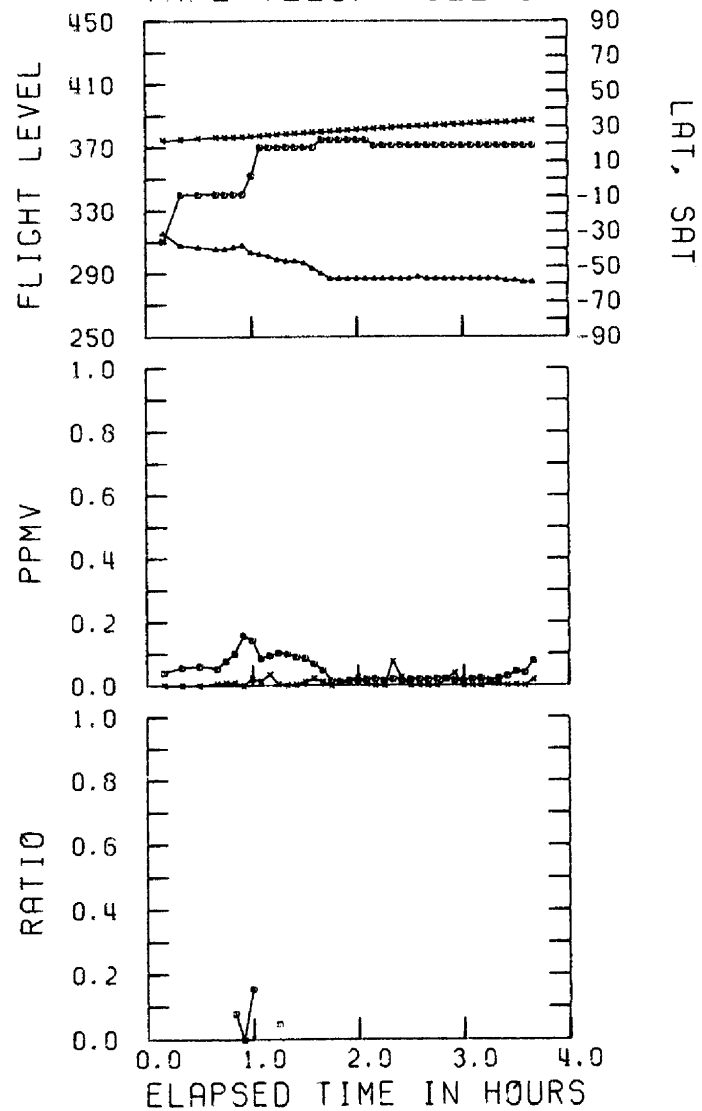
HNL TO SFO DEPARTURE 30 DEC 78
TAPE VL28, FILE 1, FLT 48



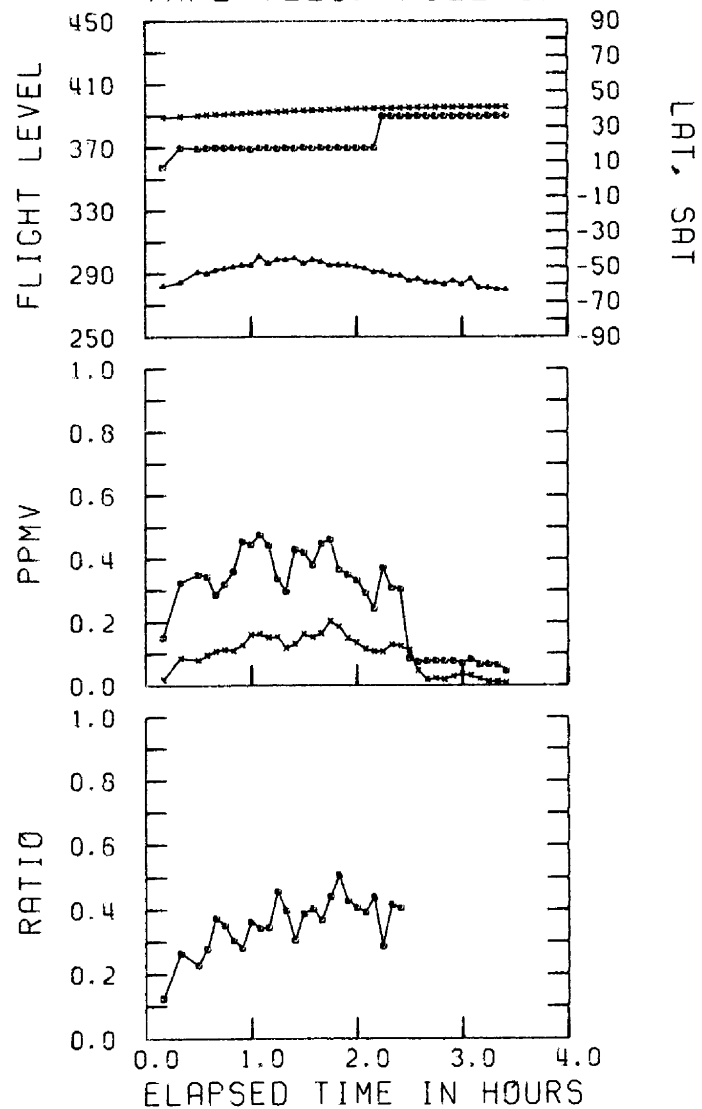
SFO TO HNL DEPARTURE 31 DEC 78
TAPE VL28, FILE 1, FLT 49



HNL TO LAX DEPARTURE 1 JAN 79
TAPE VL28, FILE 1, FLT 50

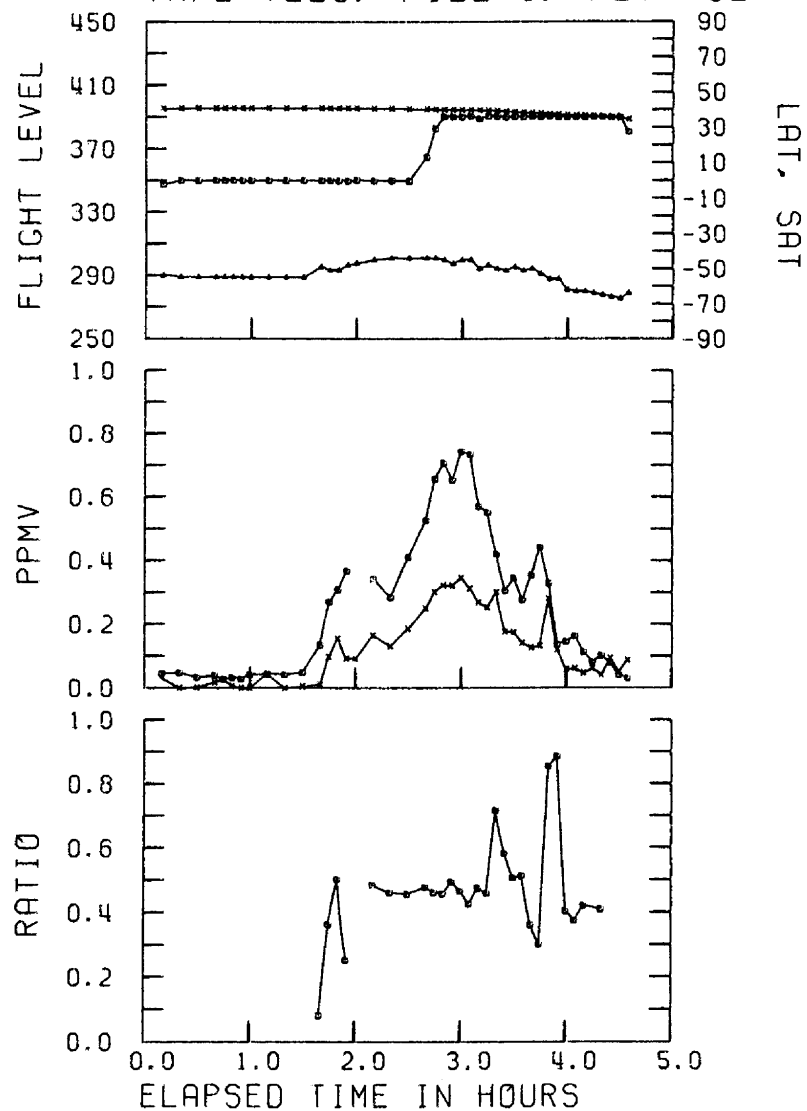


LAX TO JFK DEPARTURE 1 JAN 79
TAPE VL28, FILE 1, FLT 51

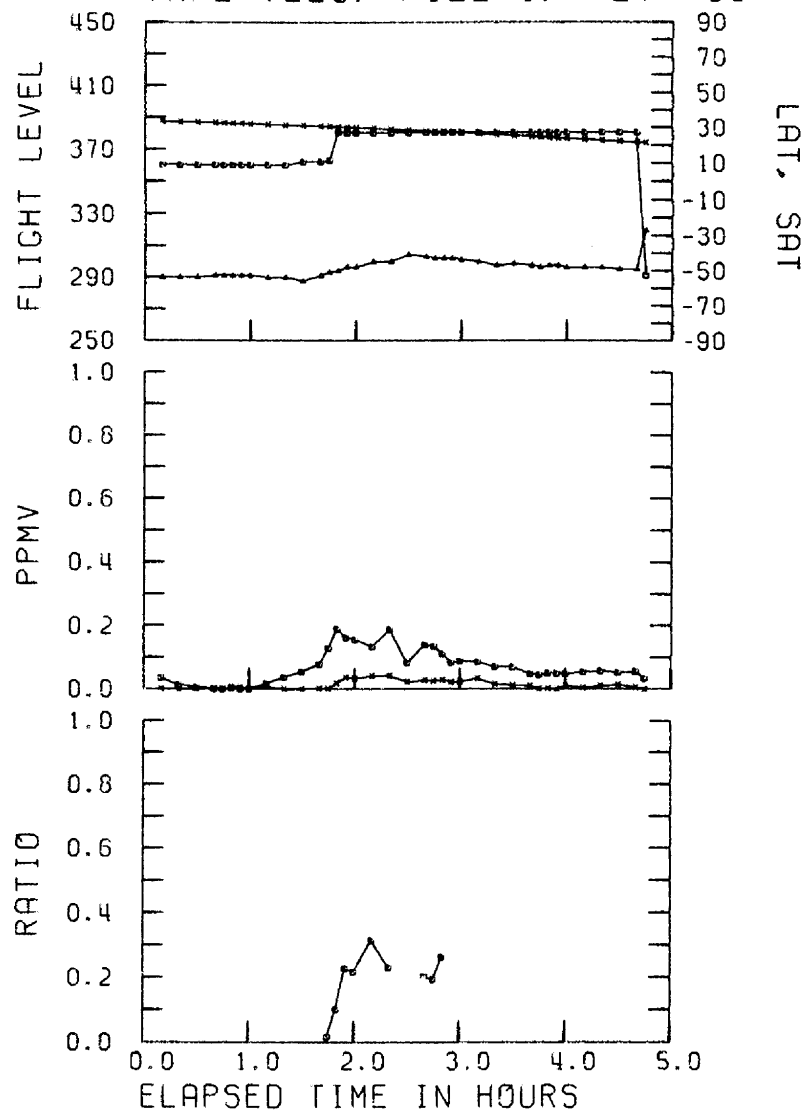


17-71

JFK TO LAX DEPARTURE 1 JAN 79
TAPE VL28, FILE 1, FLT 52

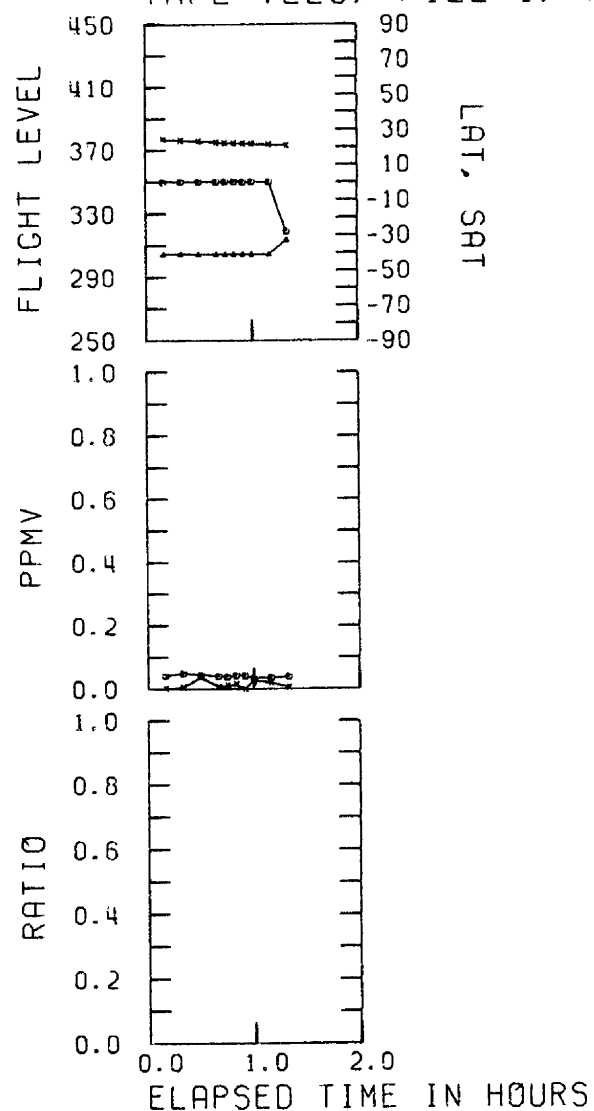


LAX TO HNL DEPARTURE 2 JAN 79
TAPE VL28, FILE 1, FLT 53

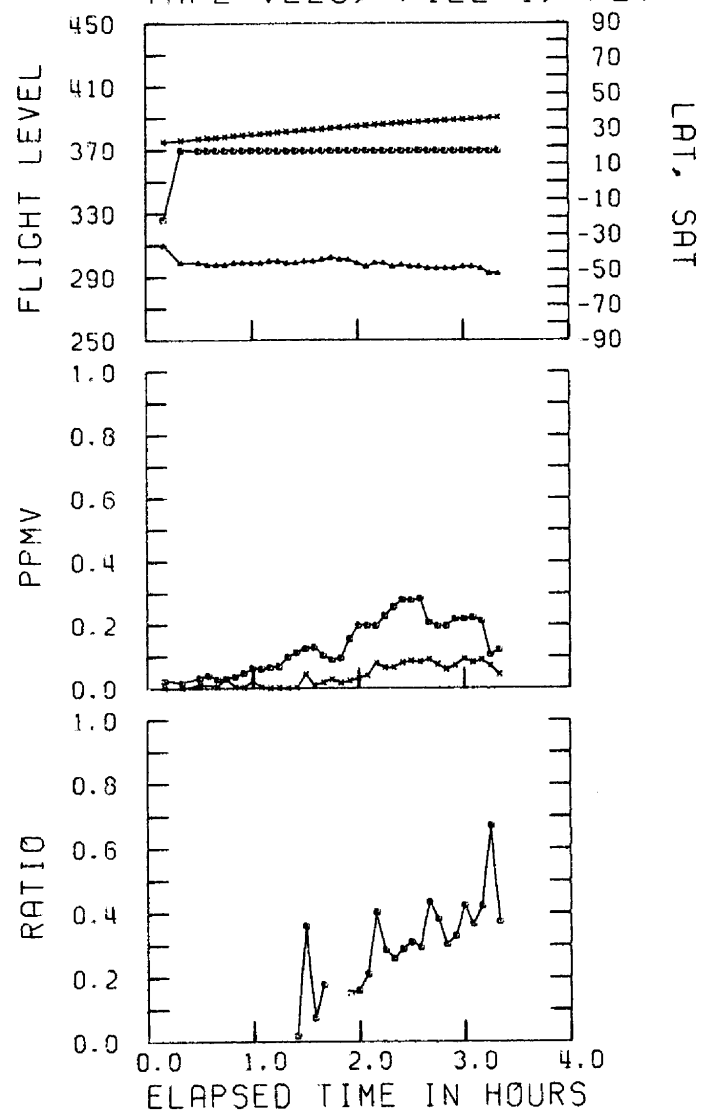


C-72

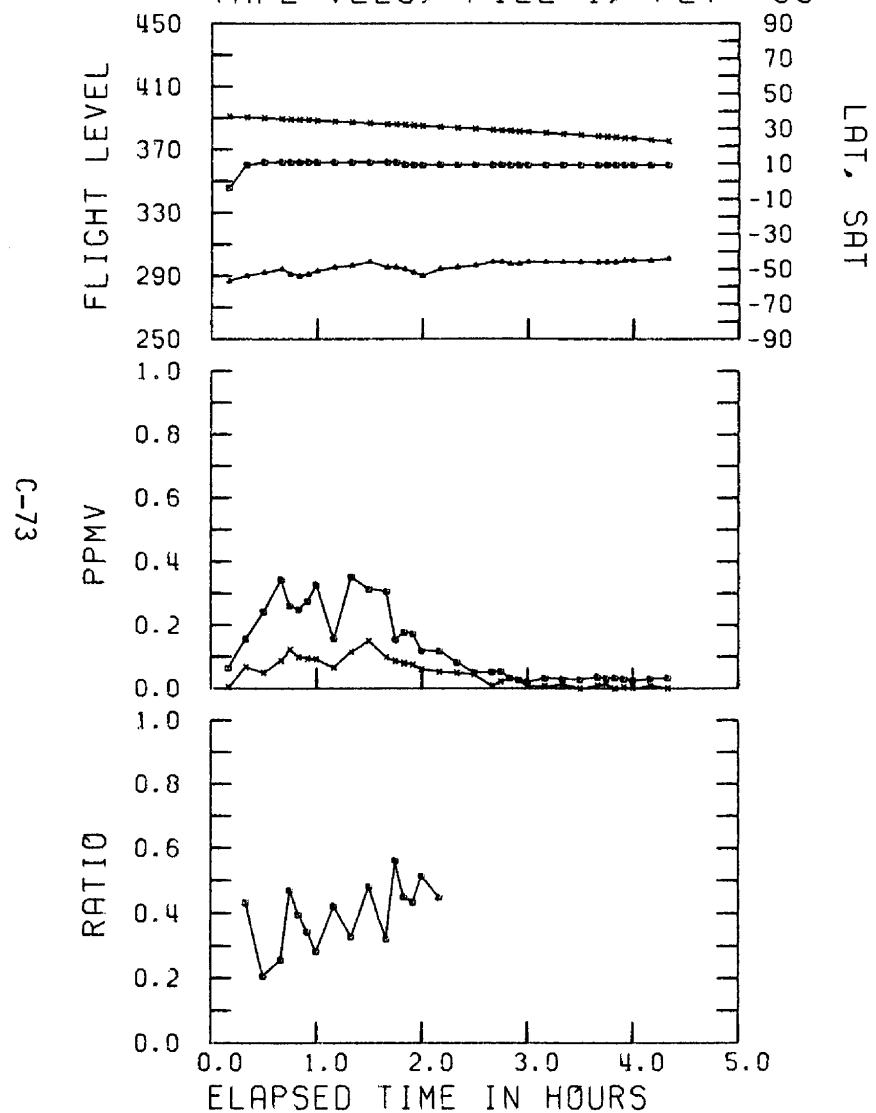
LAX TO HNL DEPARTURE 2 JAN 79
TAPE VL28, FILE 1, FLT 54



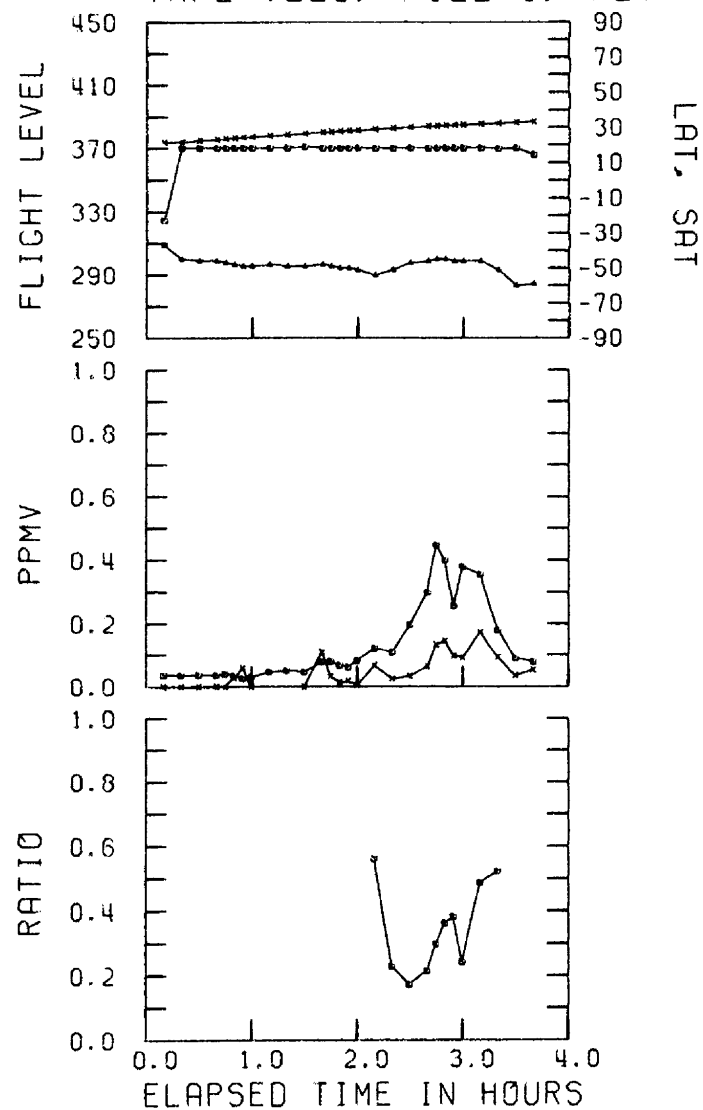
HNL TO SFO DEPARTURE 2 JAN 79
TAPE VL28, FILE 1, FLT 55



SFO TO HNL DEPARTURE 4 JAN 79
TAPE VL28, FILE 1, FLT 56

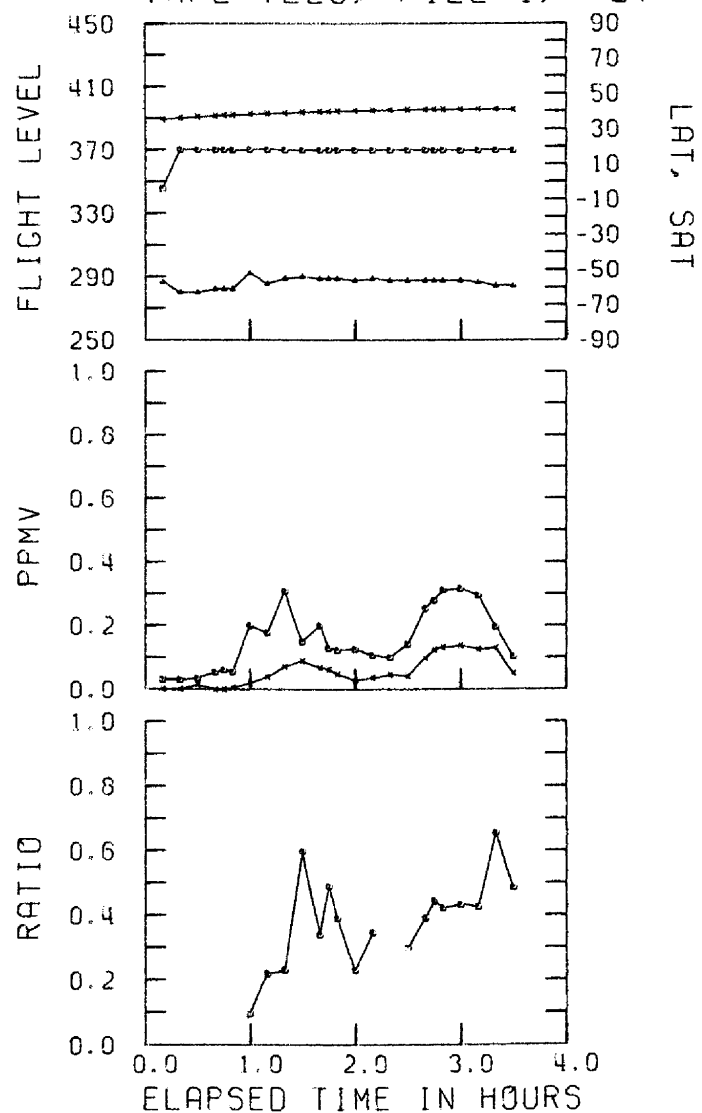


HNL TO LAX DEPARTURE 5 JAN 79
TAPE VL28, FILE 1, FLT 57

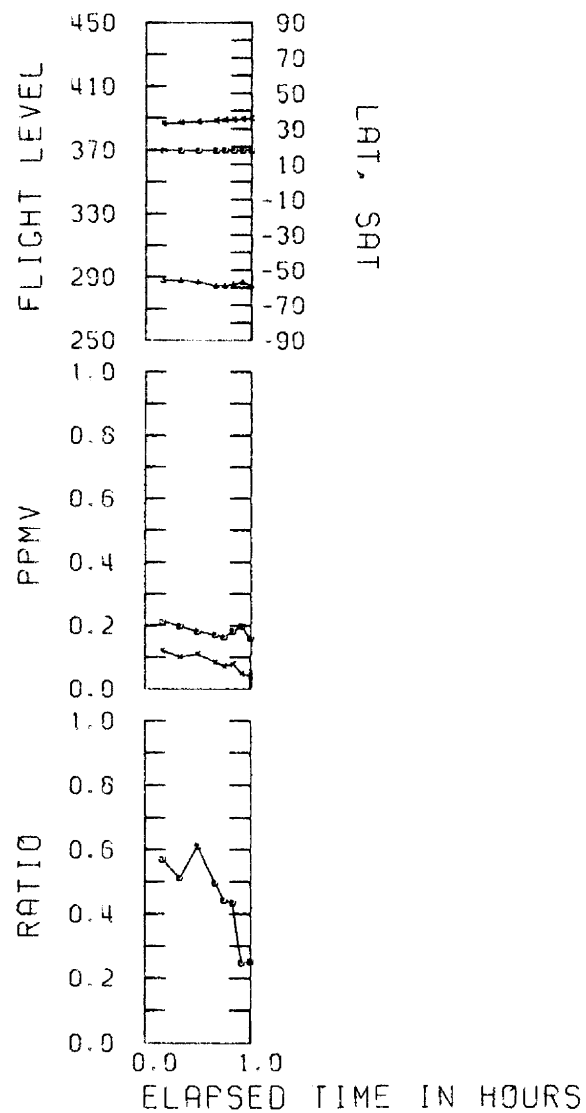


C-74

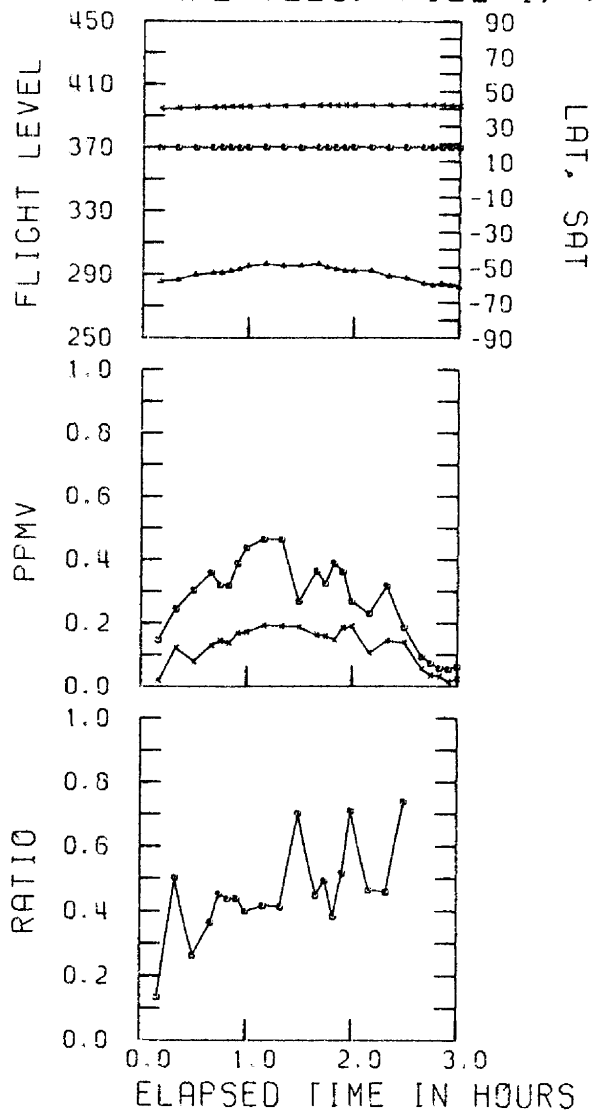
LAX TO JFK DEPARTURE 5 JAN 79
TAPE VL28, FILE 1, FLT 58



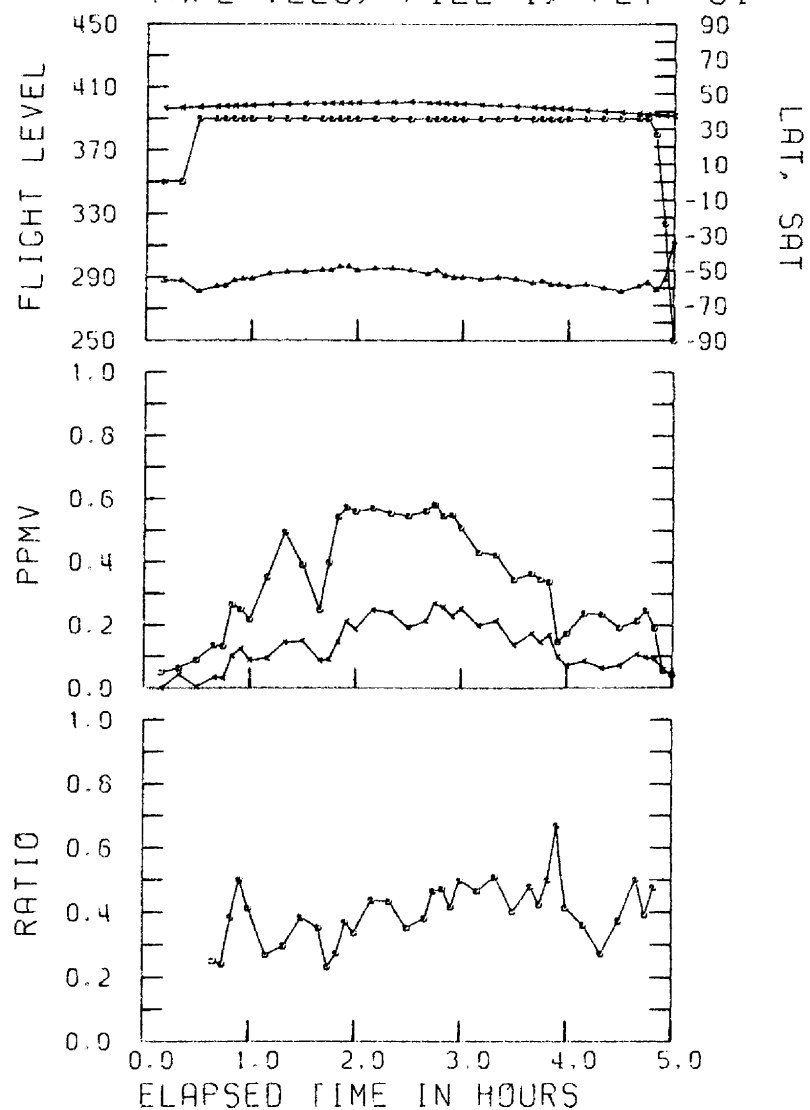
HNL TO SFO
DEPARTURE 7 JAN 79
TAPE VL28, FILE 1, FLT 59



SFO TO JFK DEPARTURE 7 JAN 79
TAPE VL28, FILE 1, FLT 60

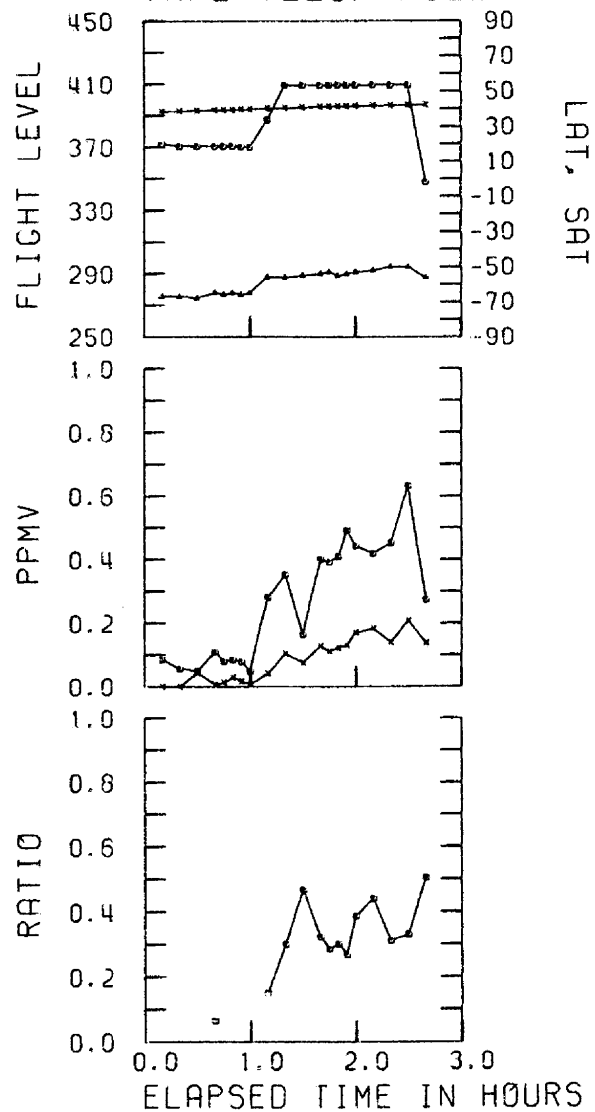


JFK TO SFO DEPARTURE 7 JAN 79
TAPE VL28, FILE 1, FLT 61

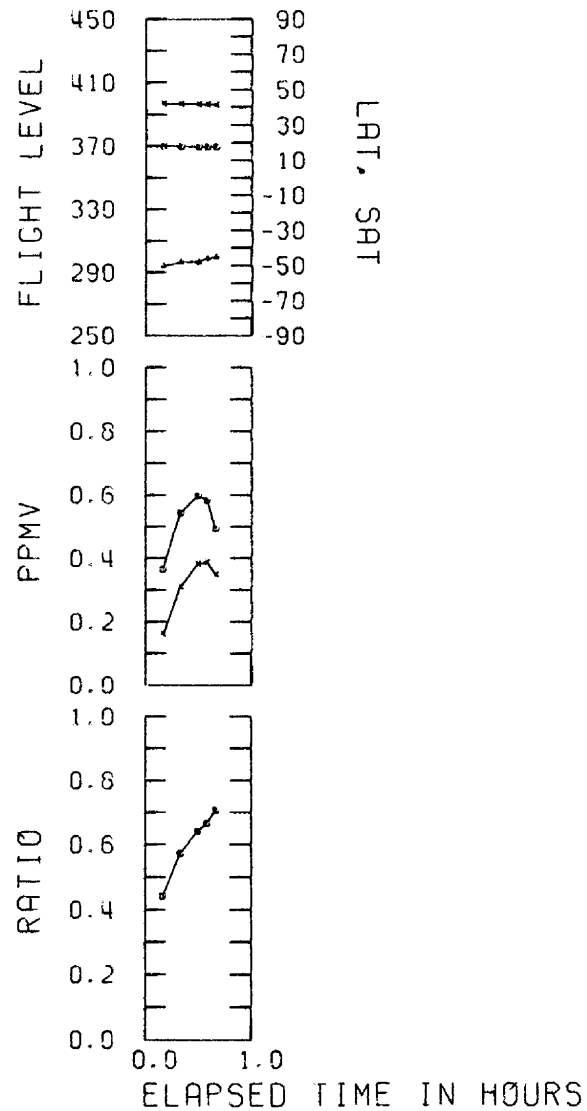


9/-3

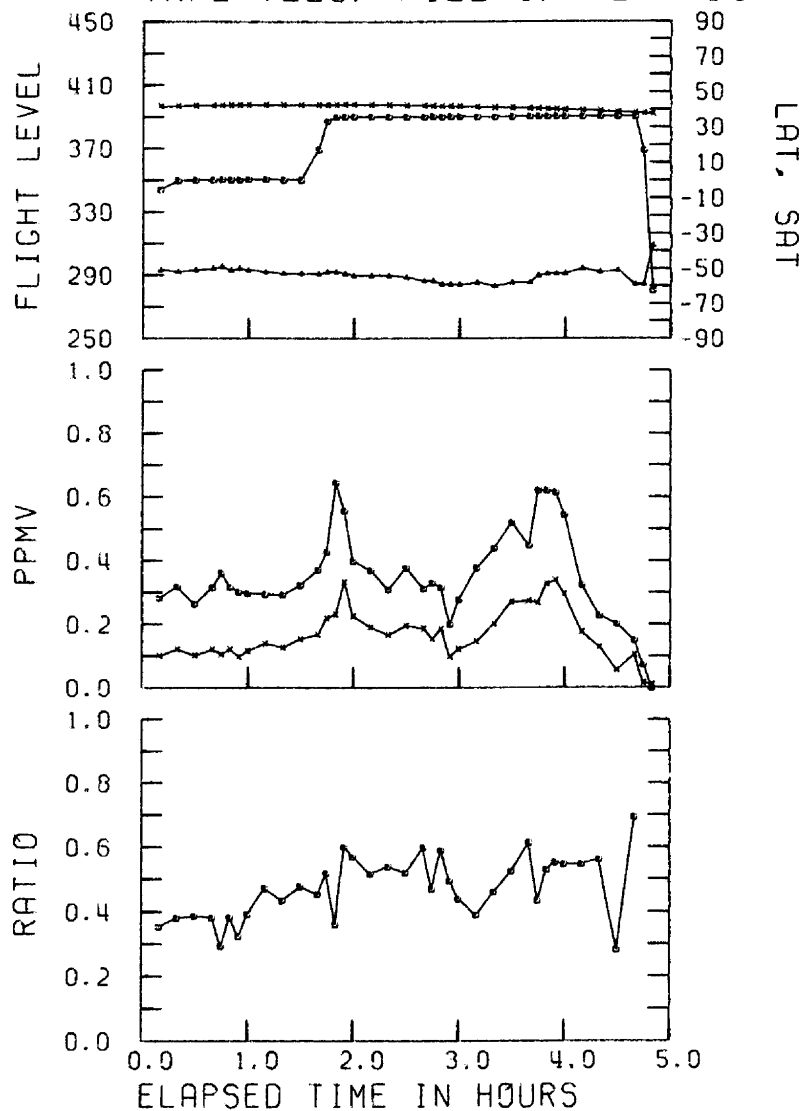
SFO TO ORD DEPARTURE 8 JAN 79
TAPE VL28, FILE 1, FLT 62



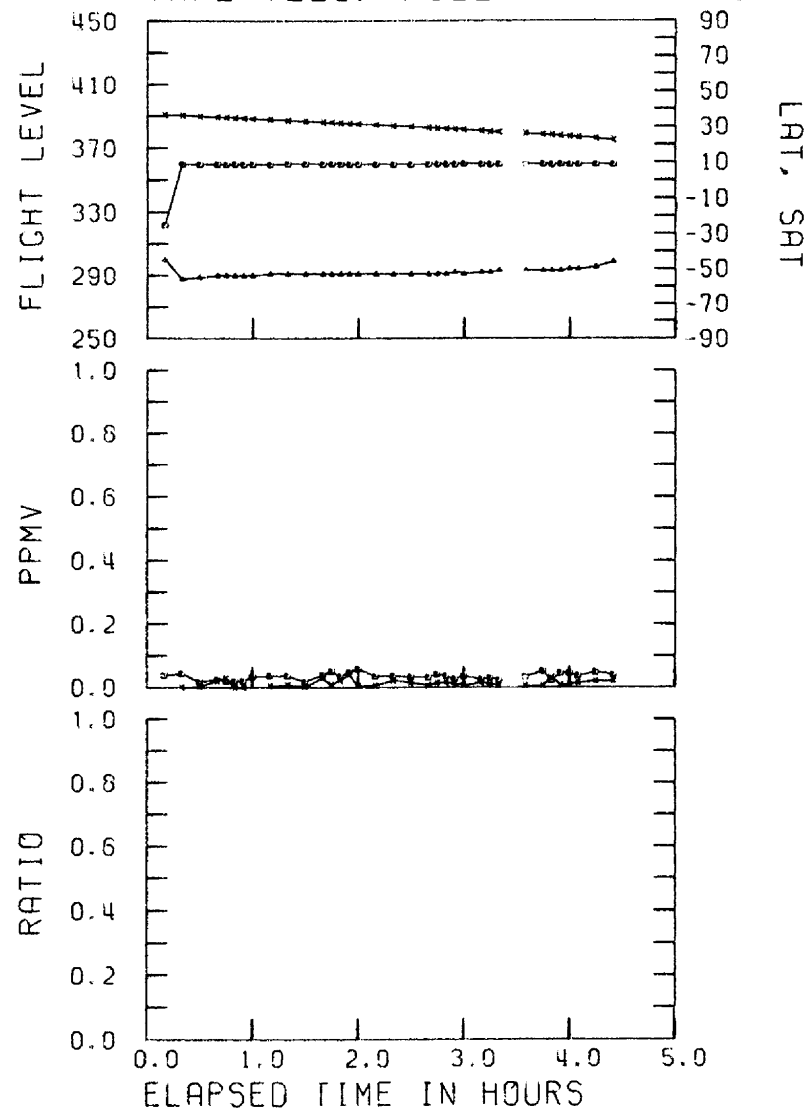
ORD TO JFK
DEPARTURE 9 JAN 79
TAPE VL28, FILE 1, FLT 63



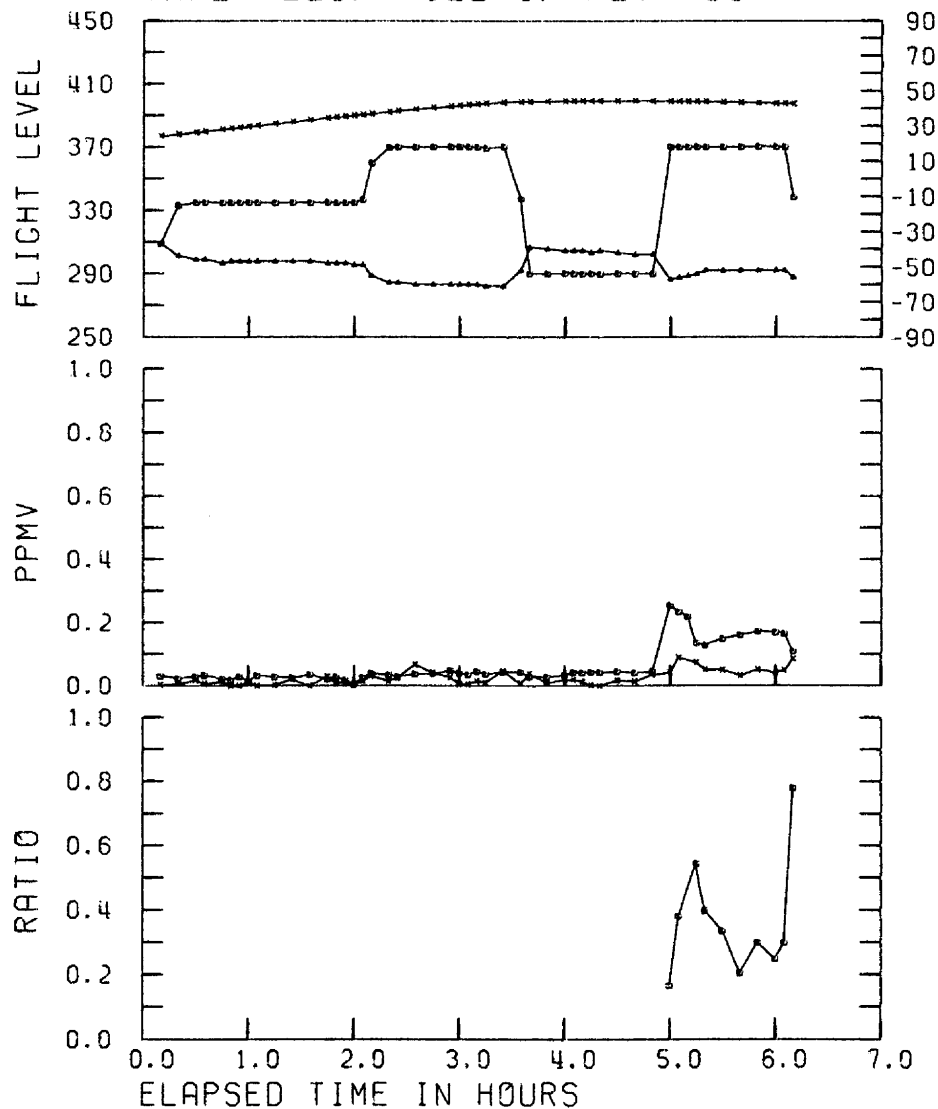
JFK TO SFO DEPARTURE 9 JAN 79
TAPE VL28, FILE 1, FLT 64



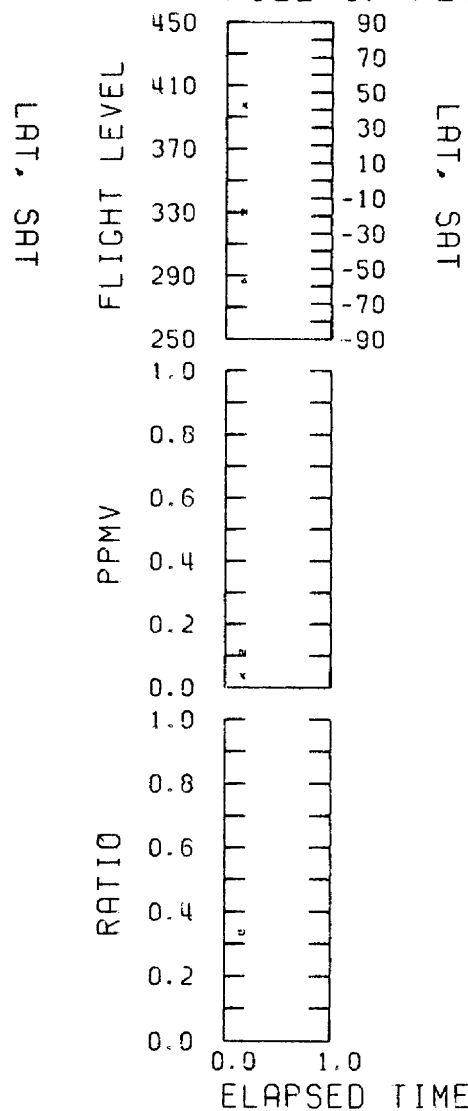
SFO TO HNL DEPARTURE 9 JAN 79
TAPE VL28, FILE 1, FLT 65



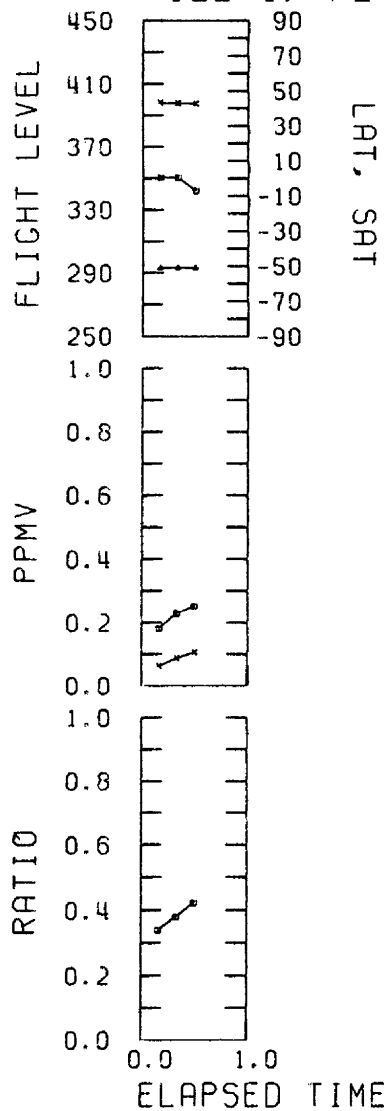
HNL TO ORD DEPARTURE 10 JAN 79
TAPE VL28, FILE 1, FLT 66



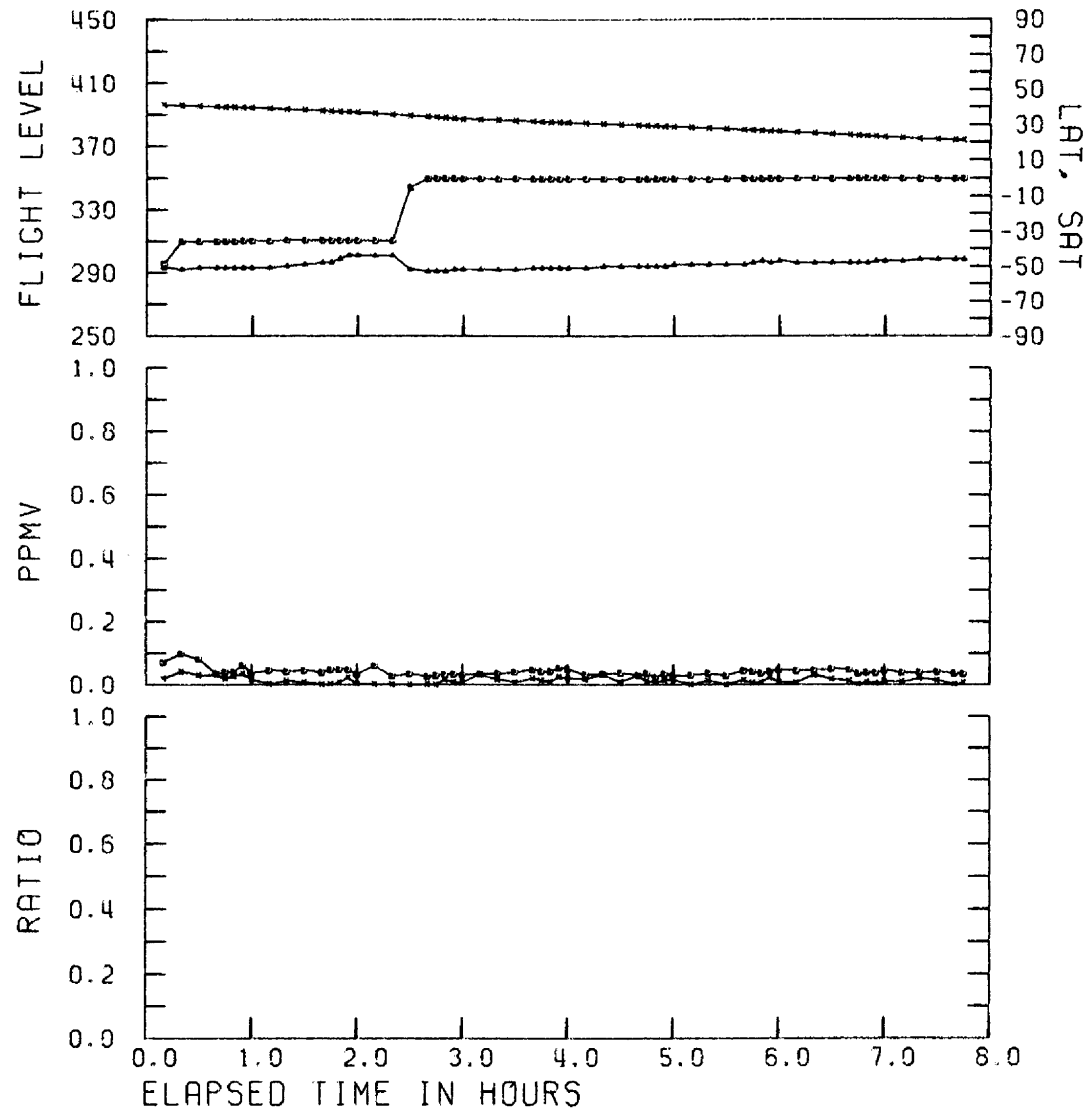
ORD TO YYZ
DEPARTURE 10 JAN 79
TAPE VL28,
FILE 1, FLT 67



YYZ TO ORD
DEPARTURE 10 JAN 79
TAPE VL28,
FILE 1, FLT 68

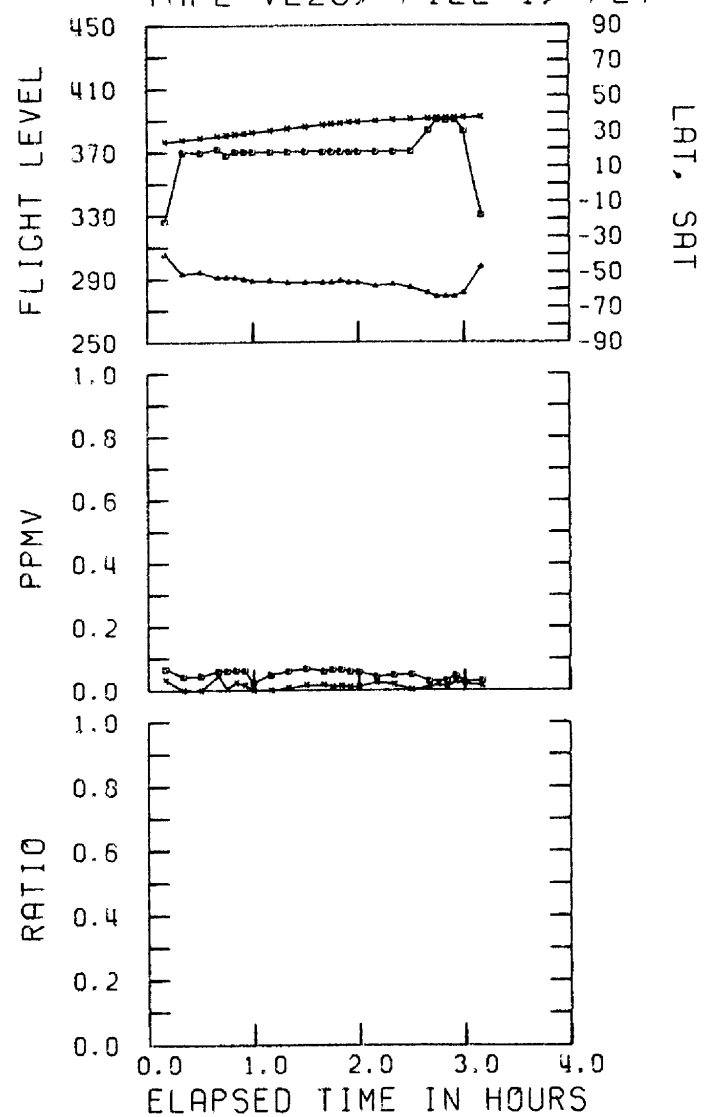


ORD TO HNL DEPARTURE 10 JAN 79
TAPE VL28, FILE 1, FLT 69

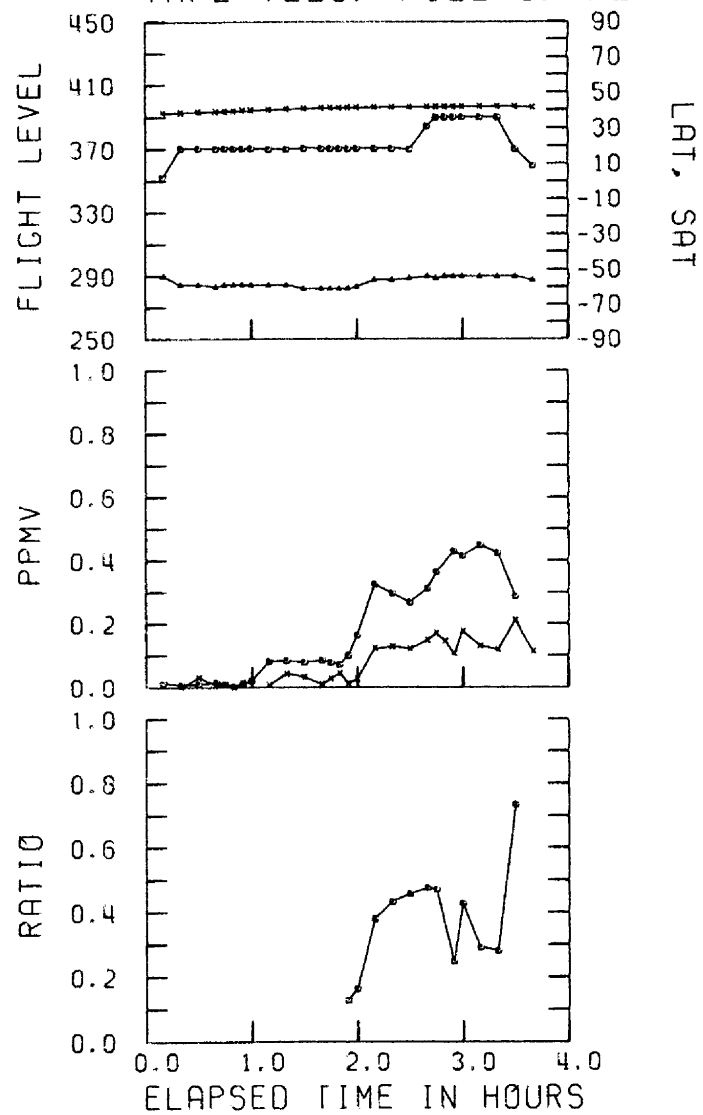


08-C

HNL TO SFO DEPARTURE 11 JAN 79
TAPE VL28, FILE 1, FLT 70

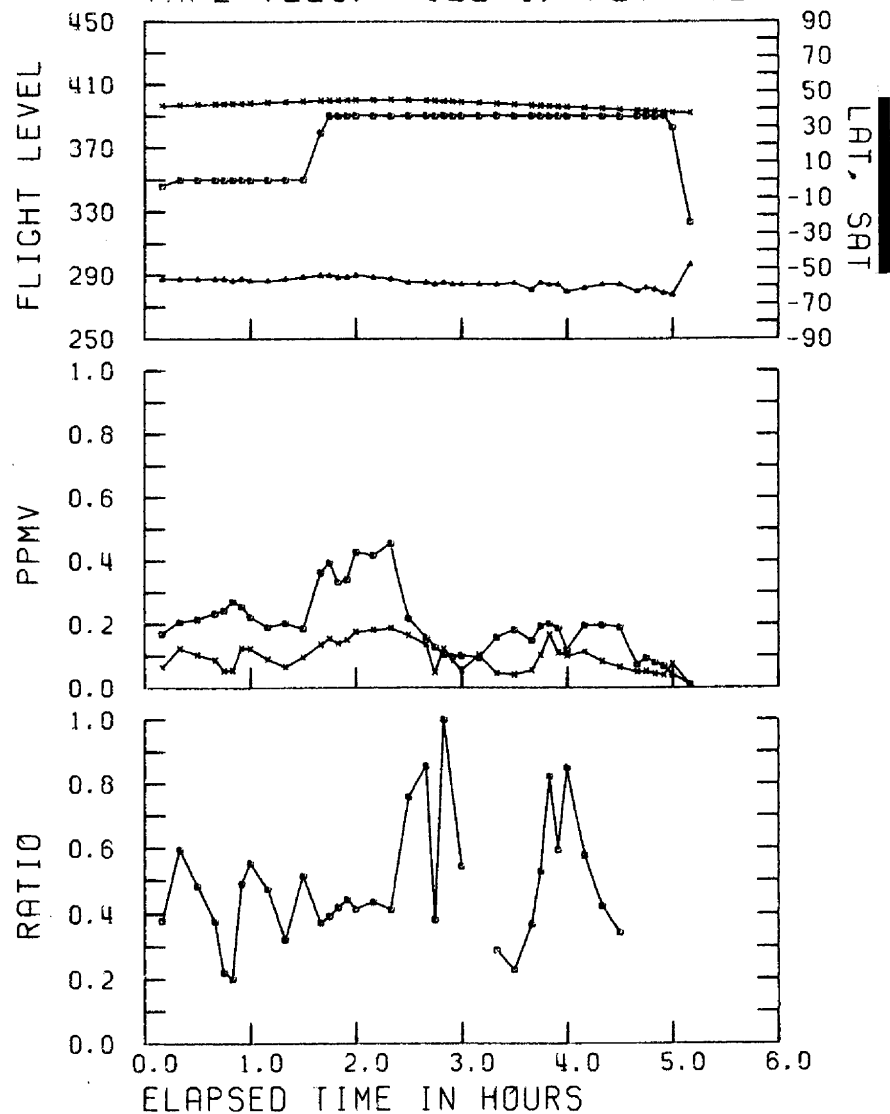


SFO TO JFK DEPARTURE 11 JAN 79
TAPE VL28, FILE 1, FLT 71

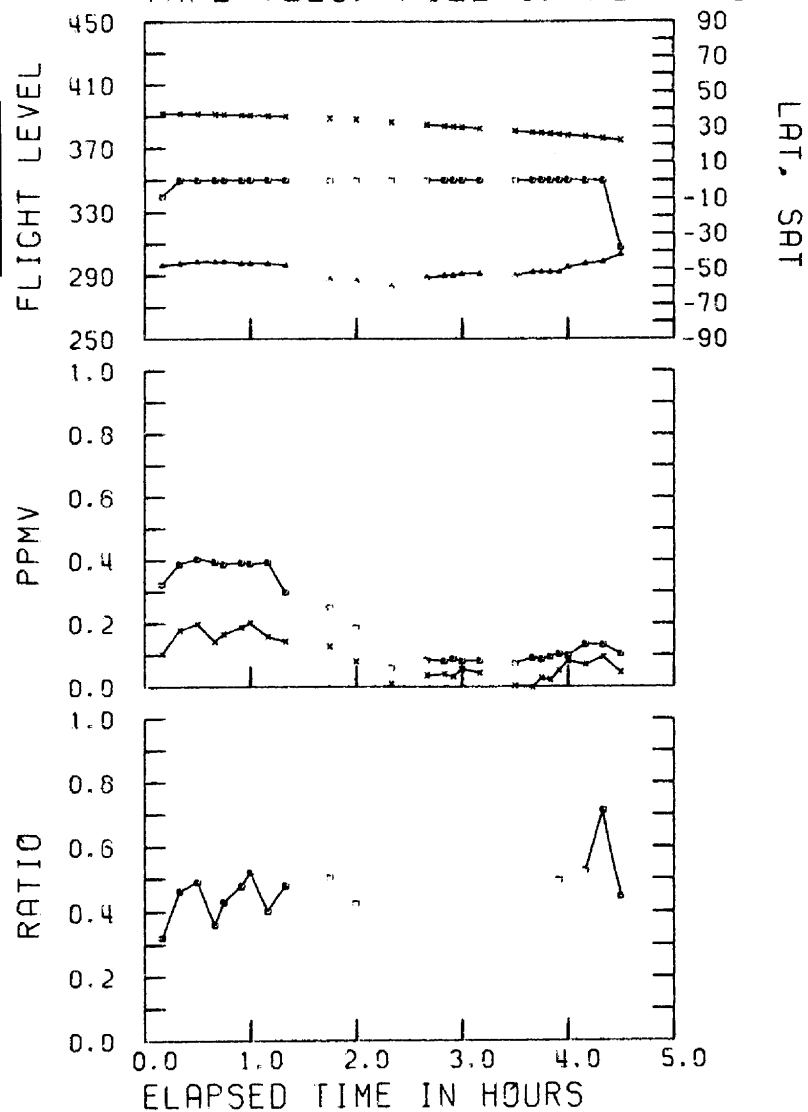


18-3

JFK TO SFO DEPARTURE 11 JAN 79
TAPE VL28, FILE 1, FLT 72

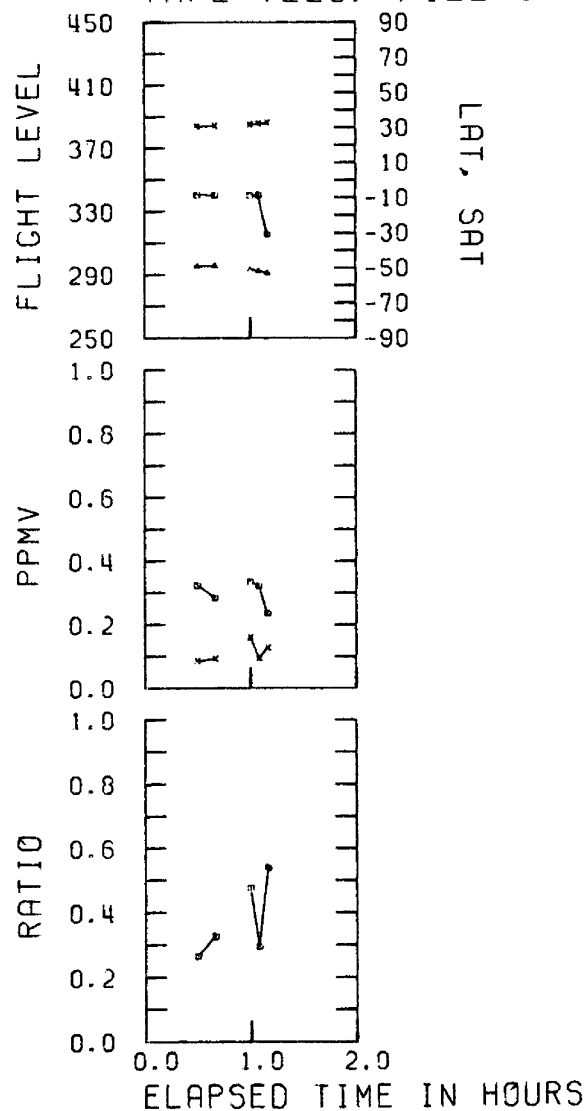


SFO TO HNL
DEPARTURE 14 JAN 79
TAPE VL28, FILE 1, FLT 73

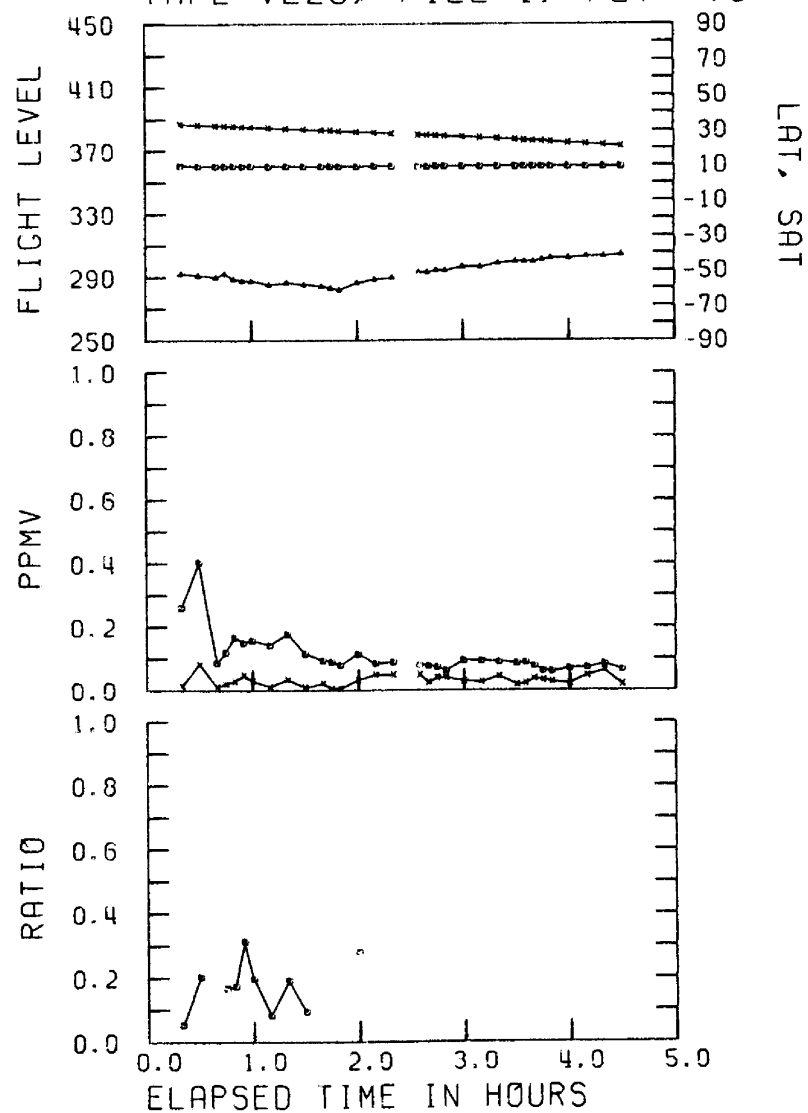


C-82

HNL TO LAX DEPARTURE 16 JAN 79
TAPE VL28, FILE 1, FLT 74

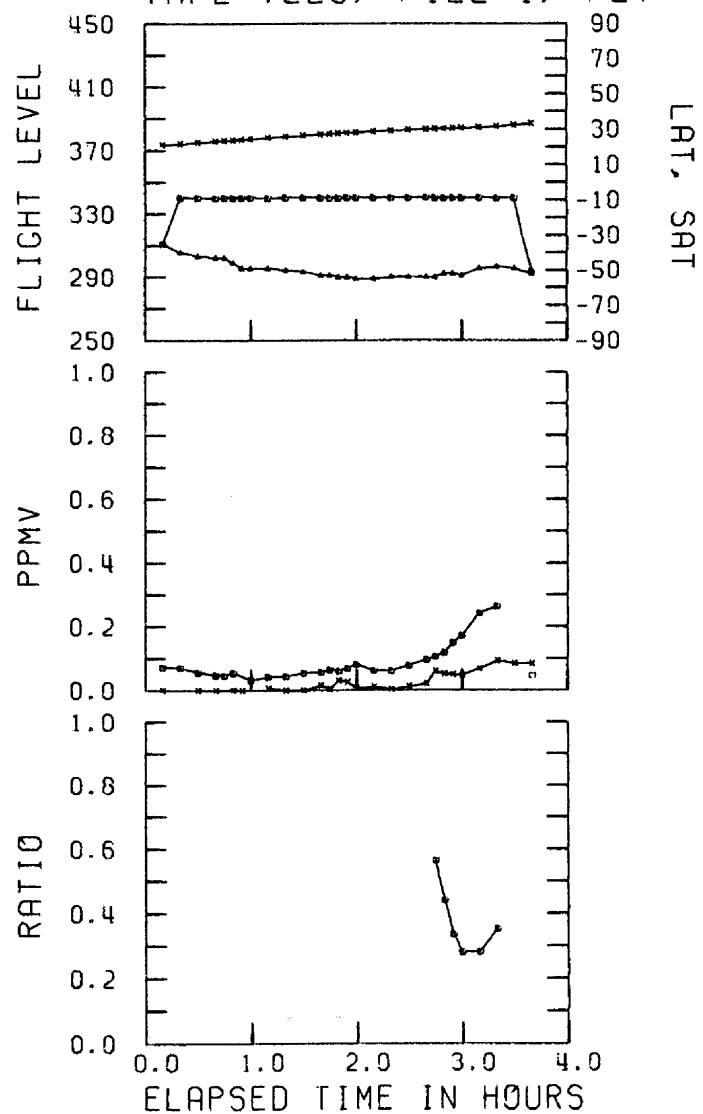


LAX TO HNL DEPARTURE 16 JAN 79
TAPE VL28, FILE 1, FLT 75

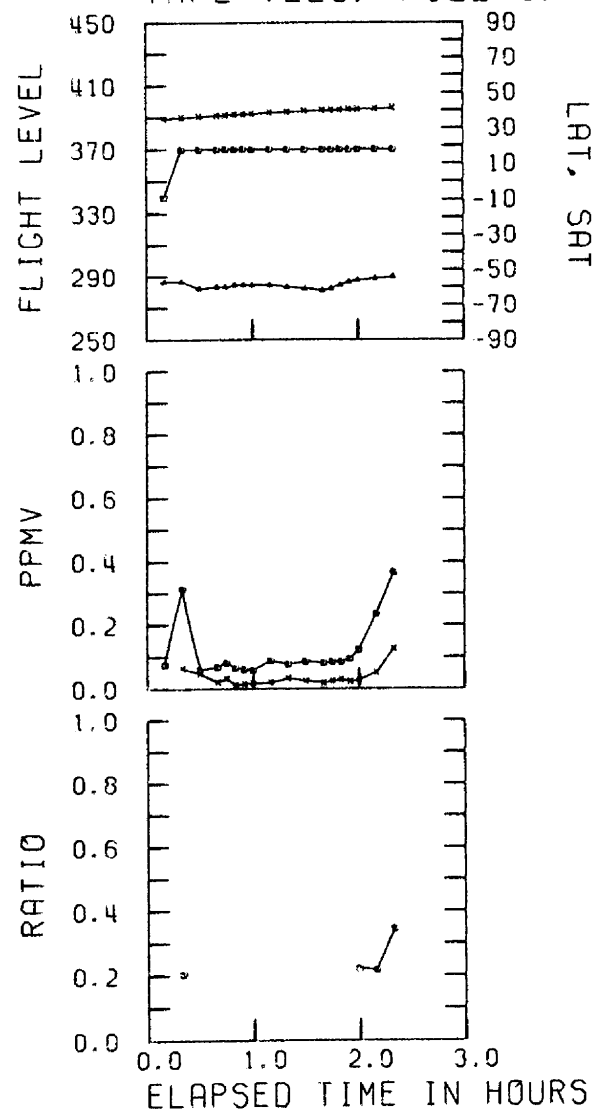


C-8-J

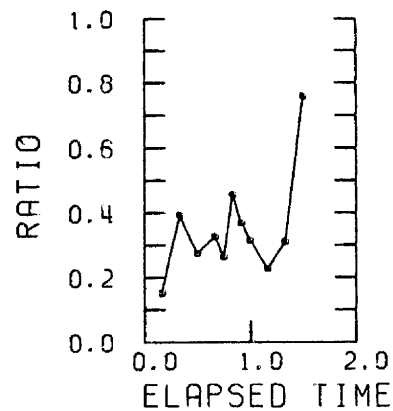
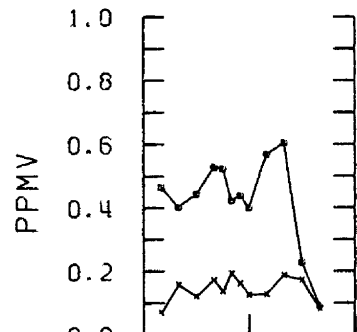
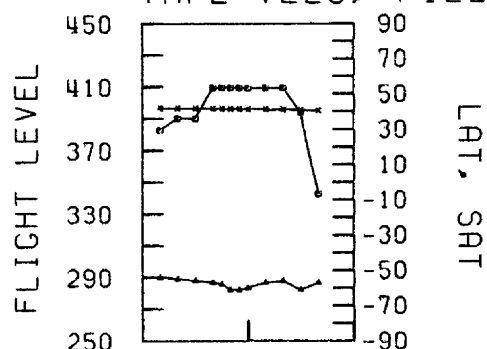
ITO TO LAX DEPARTURE 17 JAN 79
TAPE VL28, FILE 1, FLT 76



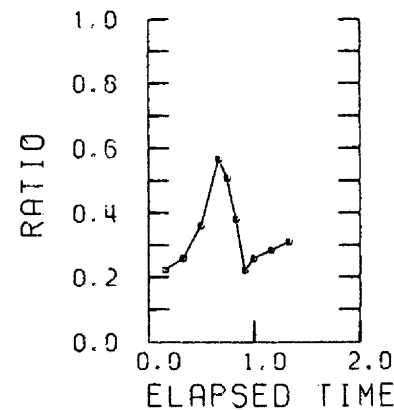
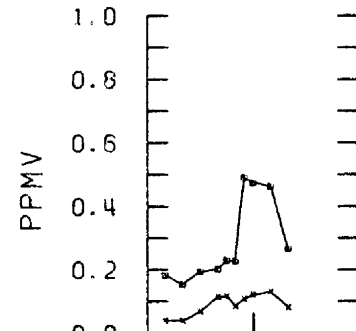
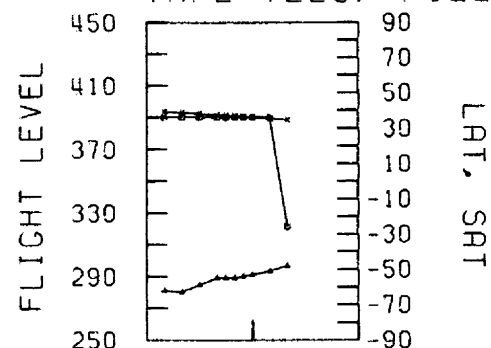
LAX TO ORD DEPARTURE 17 JAN 79
TAPE VL28, FILE 1, FLT 77



ORD TO DEN DEPARTURE 17 JAN 79
TAPE VL28, FILE 1, FLT 78

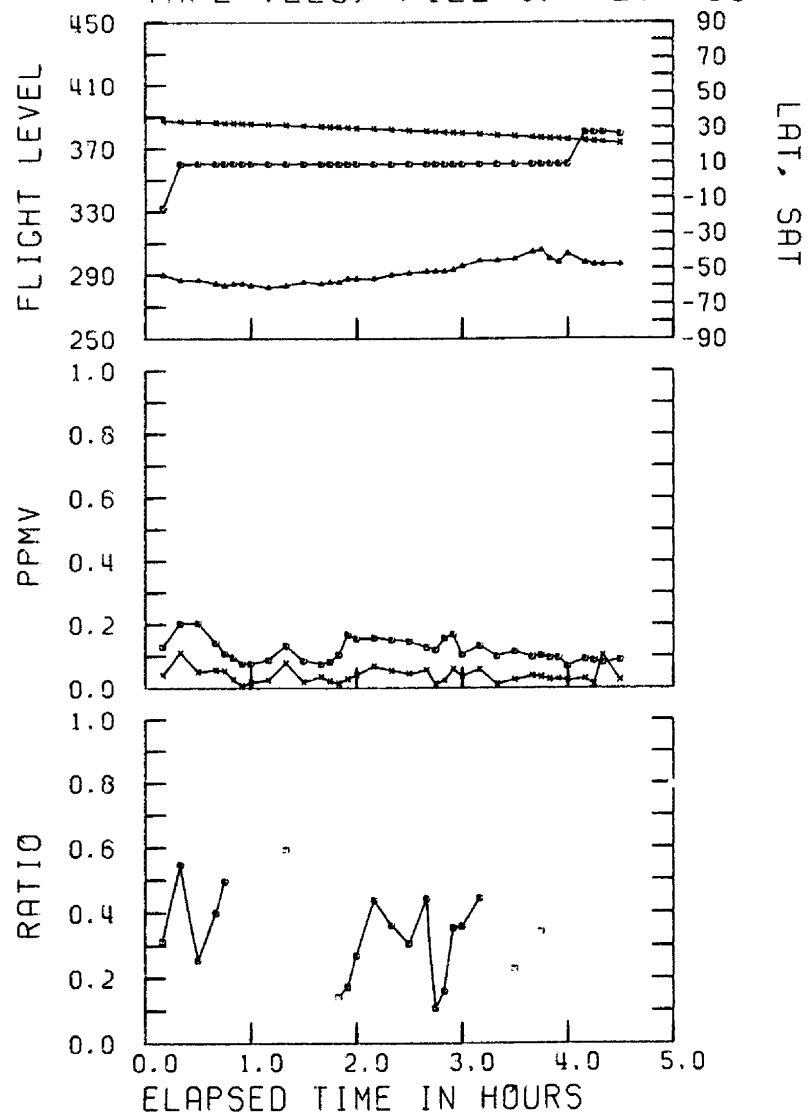


DEN TO LAX DEPARTURE 17 JAN 79
TAPE VL28, FILE 1, FLT 79

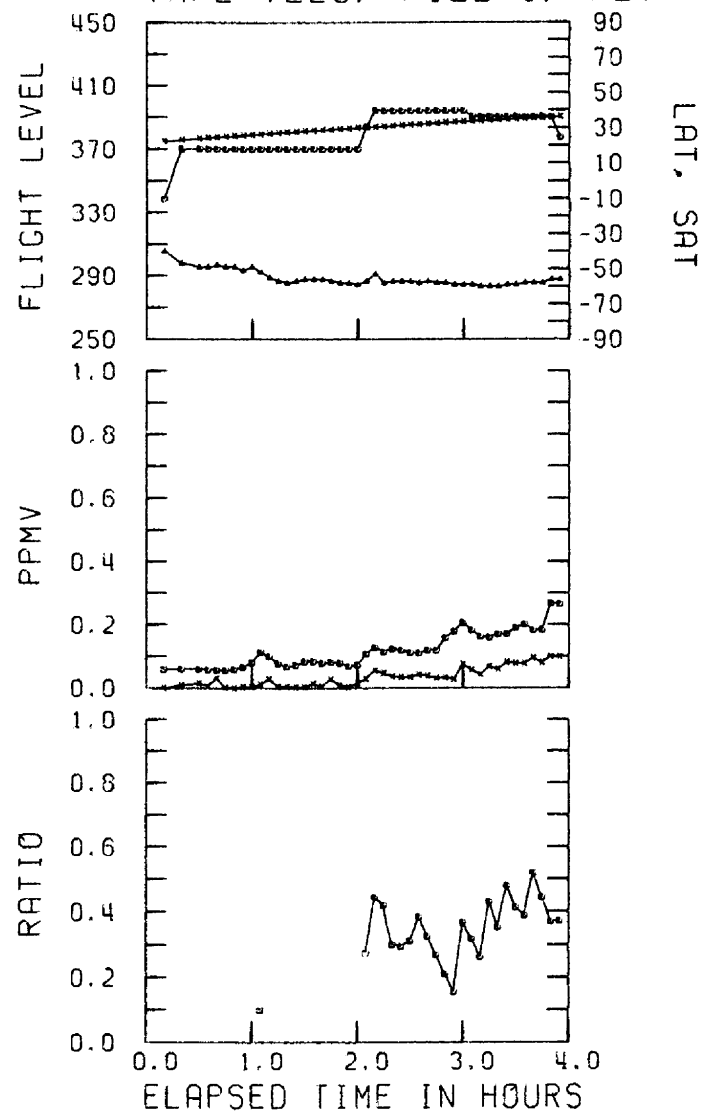


C-8-C

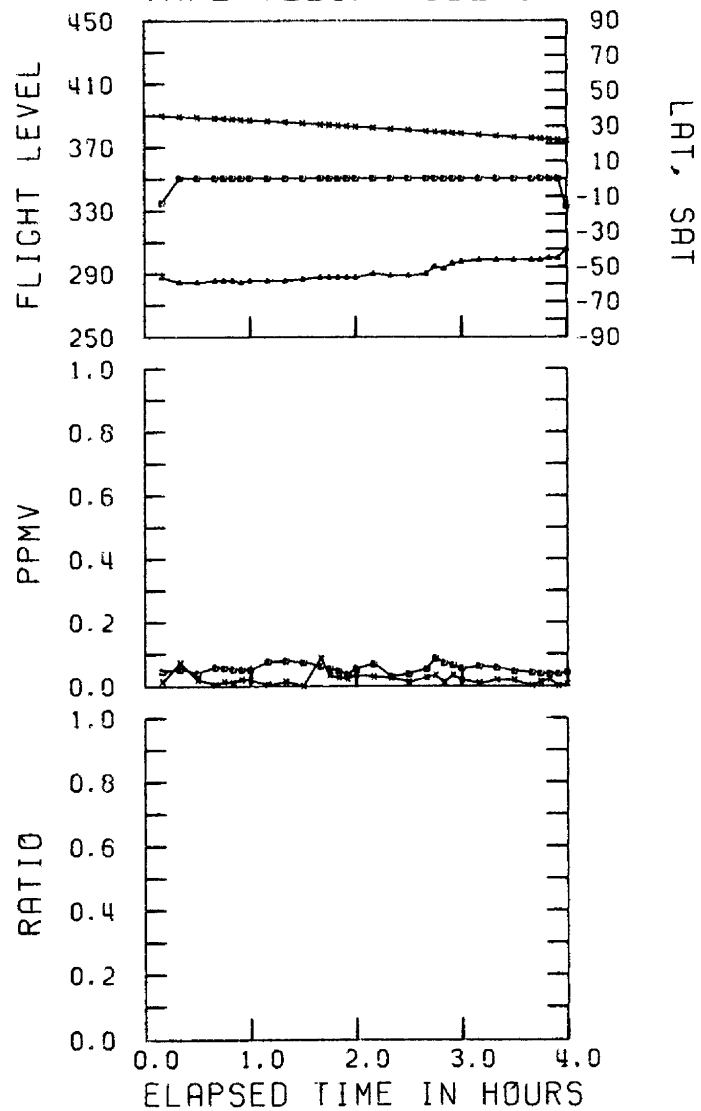
LAX TO HNL DEPARTURE 17 JAN 79
TAPE VL28, FILE 1, FLT 80



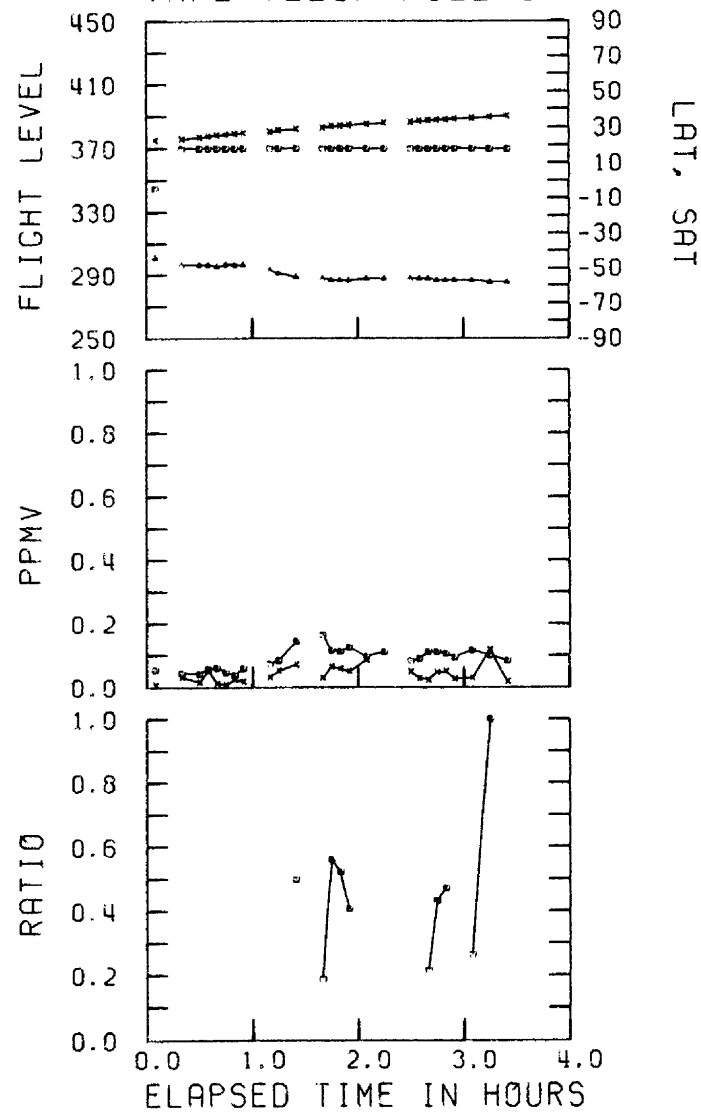
HNL TO SFO DEPARTURE 18 JAN 79
TAPE VL28, FILE 1, FLT 81



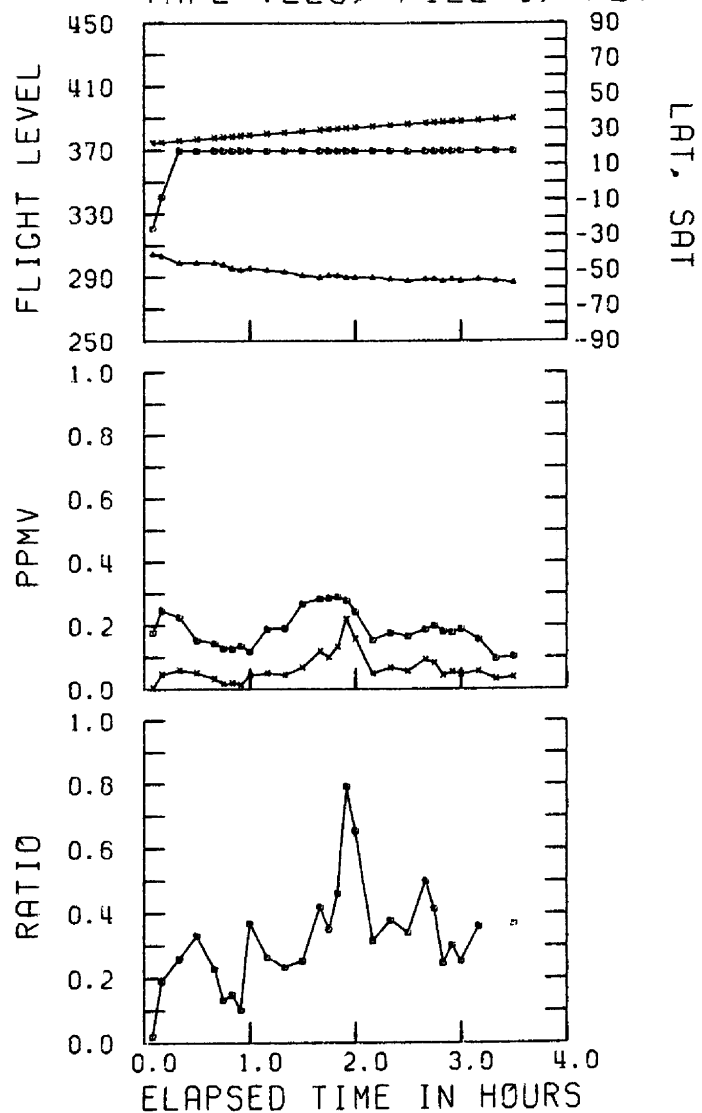
SFO TO HNL DEPARTURE 19 JAN 79
TAPE VL28, FILE 1, FLT 82



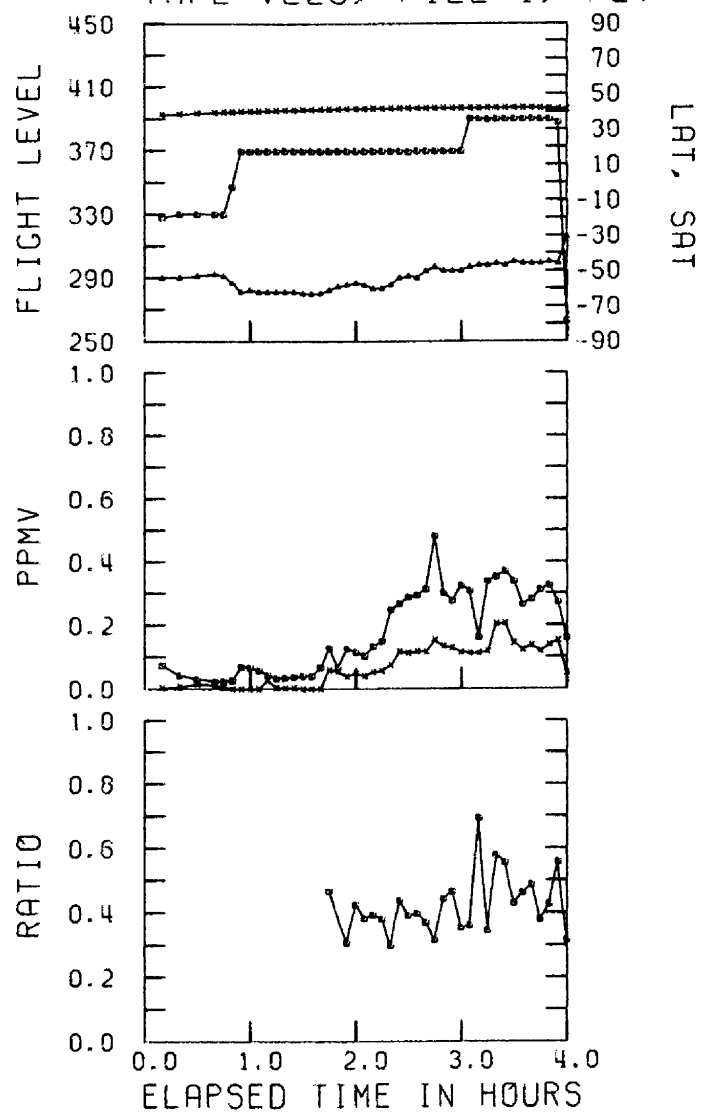
HNL TO SFO DEPARTURE 19 JAN 79
TAPE VL28, FILE 1, FLT 83



HNL TO SFO DEPARTURE 20 JAN 79
TAPE VL28, FILE 1, FLT 84

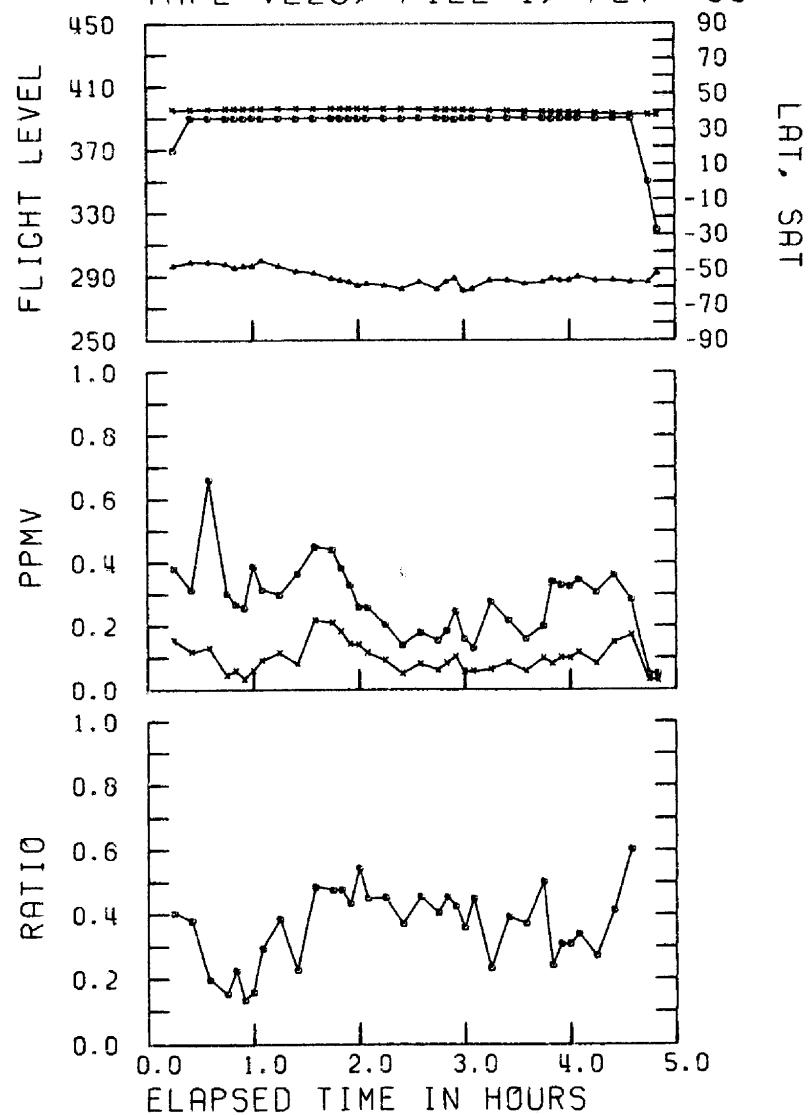


SFO TO JFK DEPARTURE 21 JAN 79
TAPE VL28, FILE 1, FLT 85

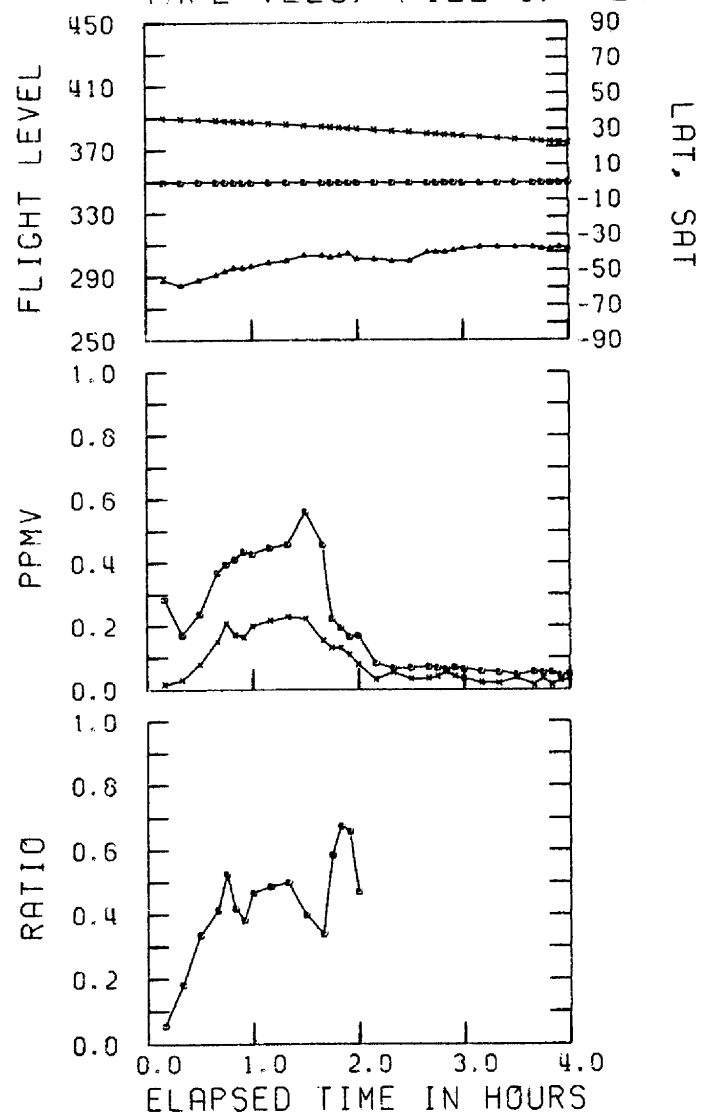


88-3

JFK TO SFO DEPARTURE 21 JAN 79
TAPE VL28, FILE 1, FLT 86

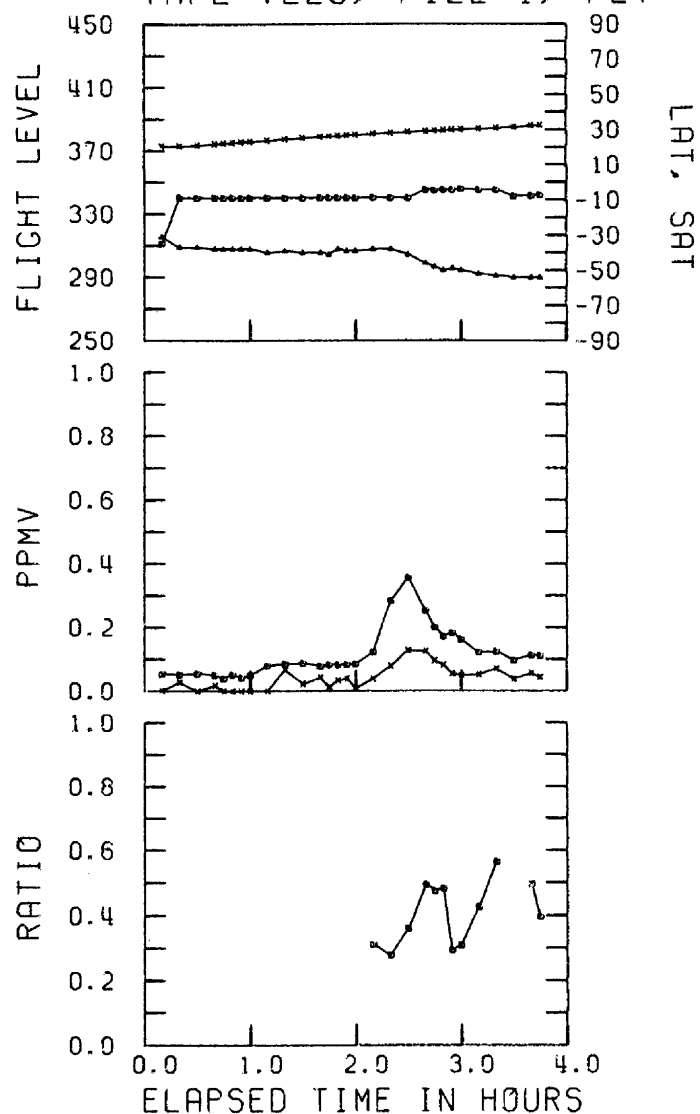


SFO TO HNL DEPARTURE 22 JAN 79
TAPE VL28, FILE 1, FLT 87

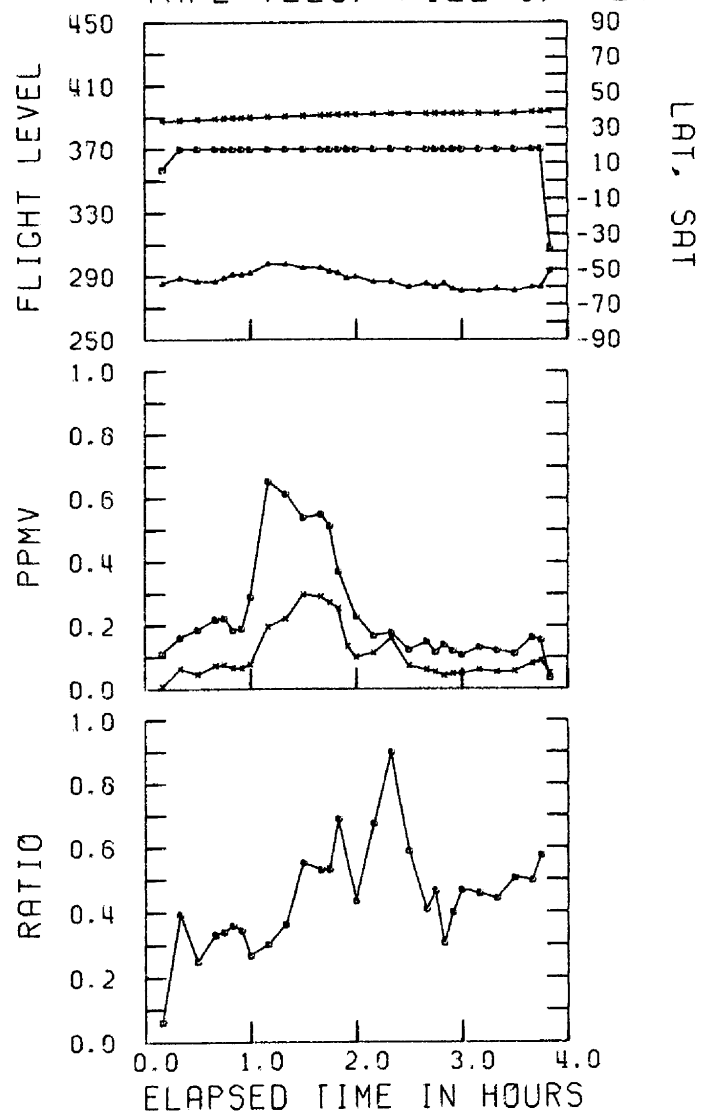


68-3

HNL TO LAX DEPARTURE 23 JAN 79
TAPE VL28, FILE 1, FLT 88

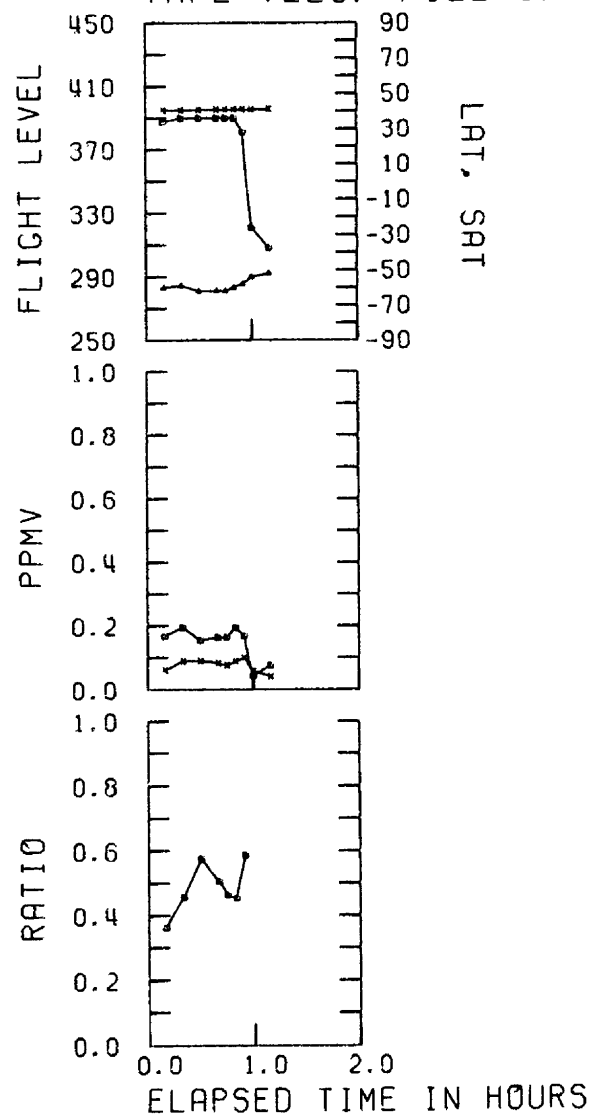


LAX TO JFK DEPARTURE 23 JAN 79
TAPE VL28, FILE 1, FLT 89

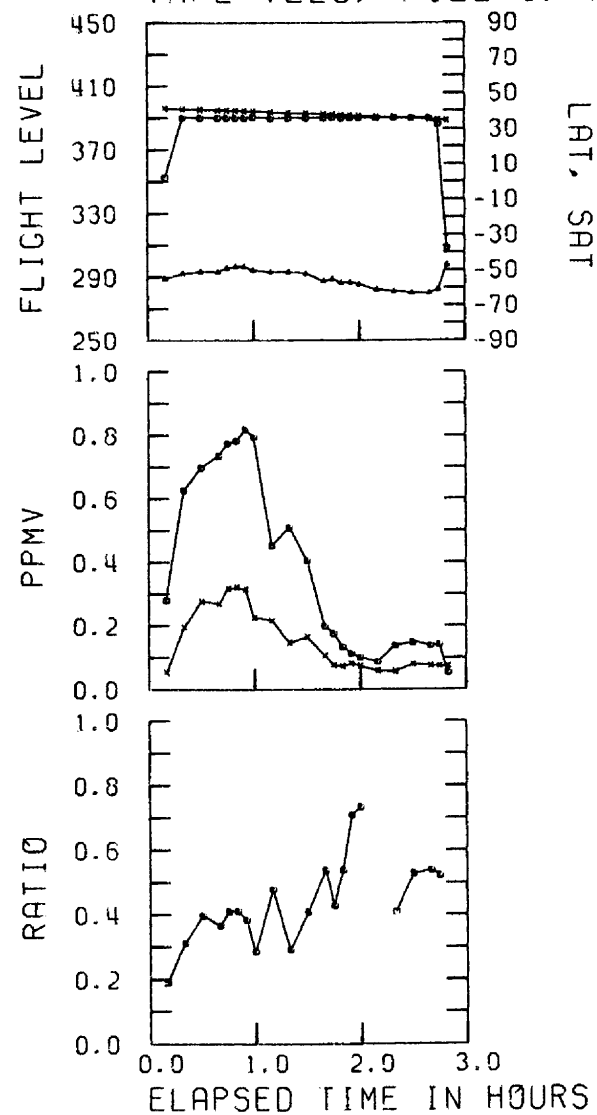


06-C

JFK TO ORD DEPARTURE 23 JAN 79
TAPE VL28, FILE 1, FLT 90

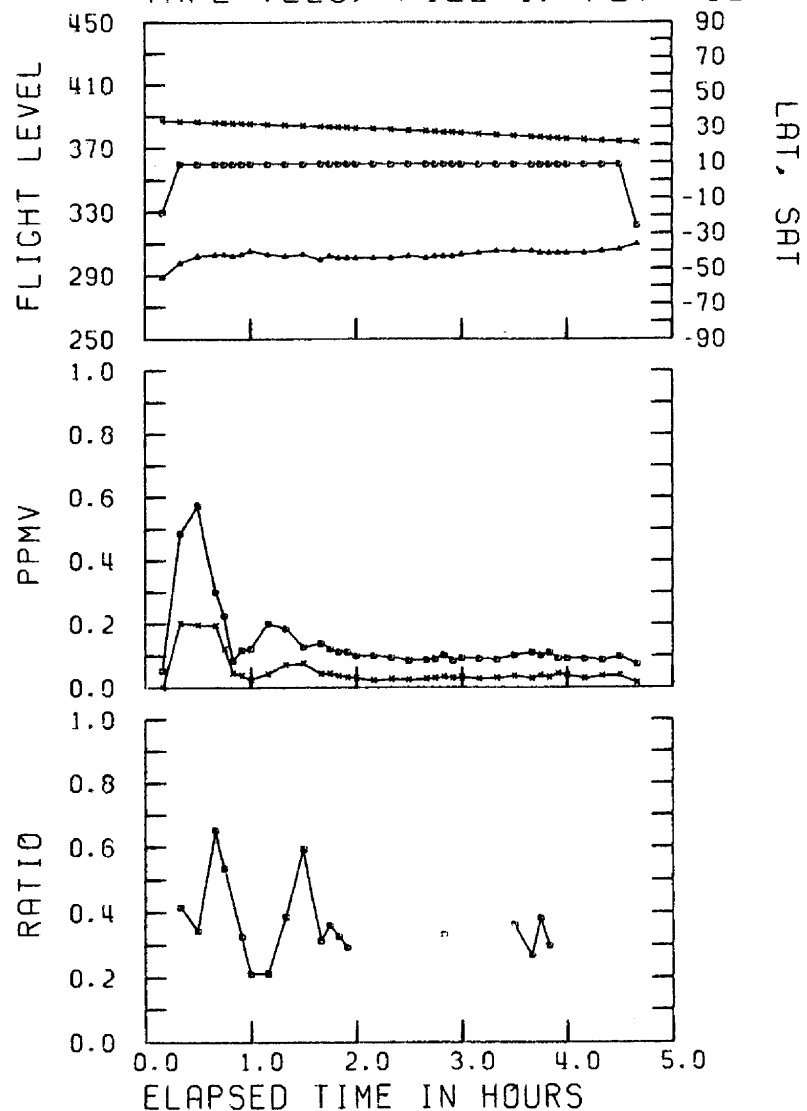


ORD TO LAX DEPARTURE 23 JAN 79
TAPE VL28, FILE 1, FLT 91

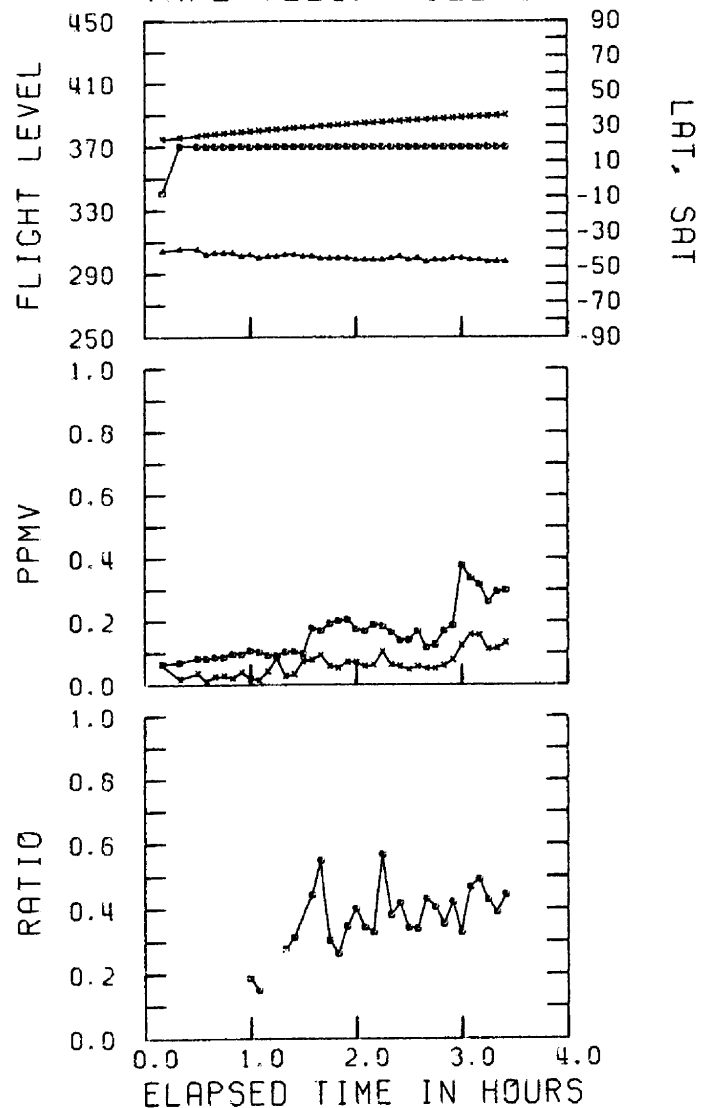


16-C

LAX TO HNL DEPARTURE 24 JAN 79
TAPE VL28, FILE 1, FLT 92

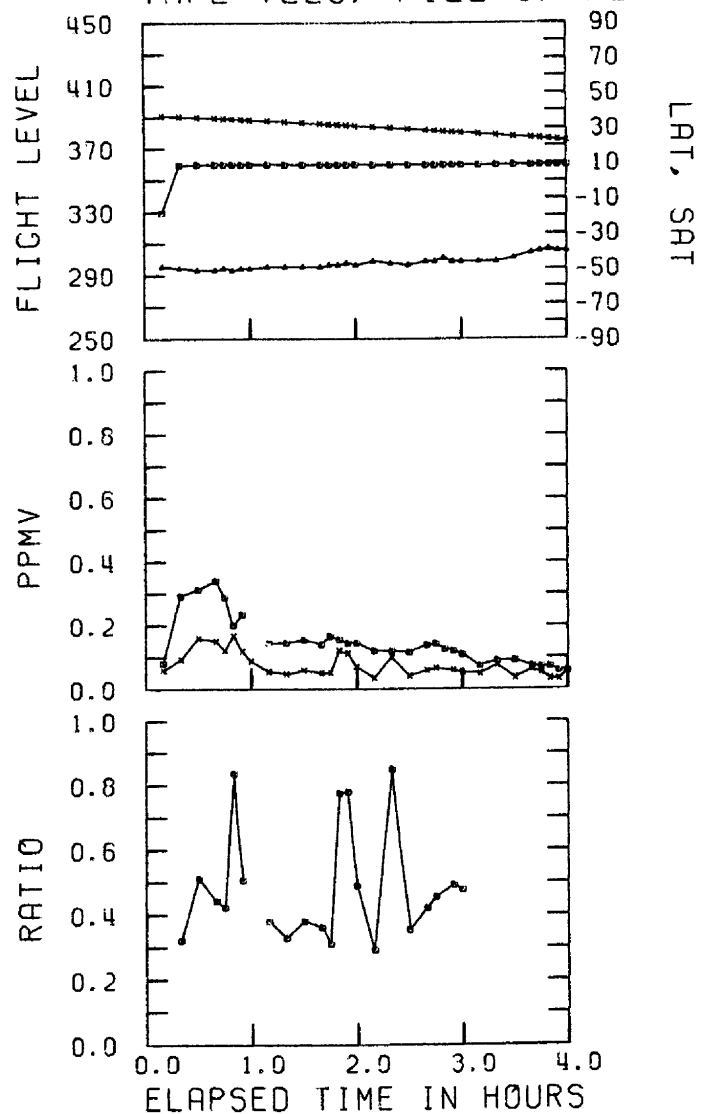


HNL TO SFO DEPARTURE 24 JAN 79
TAPE VL28, FILE 1, FLT 93

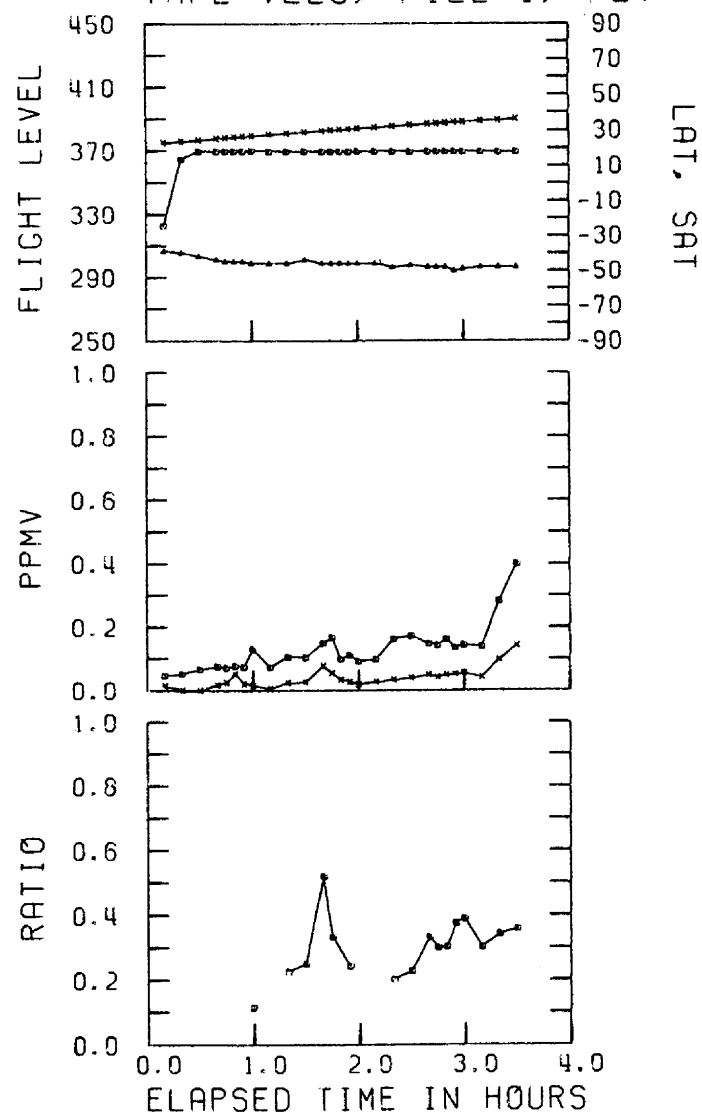


C-92

SFO TO HNL DEPARTURE 25 JAN 79
TAPE VL28, FILE 1, FLT 94

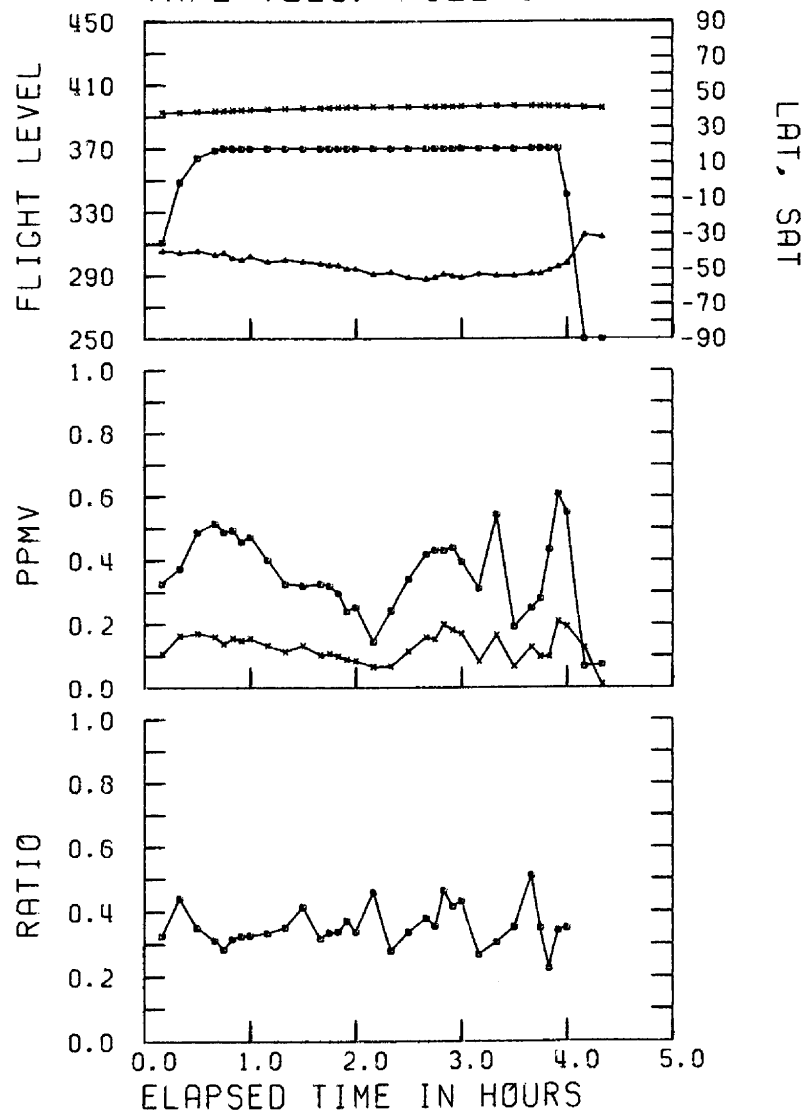


HNL TO SFO DEPARTURE 25 JAN 79
TAPE VL28, FILE 1, FLT 95

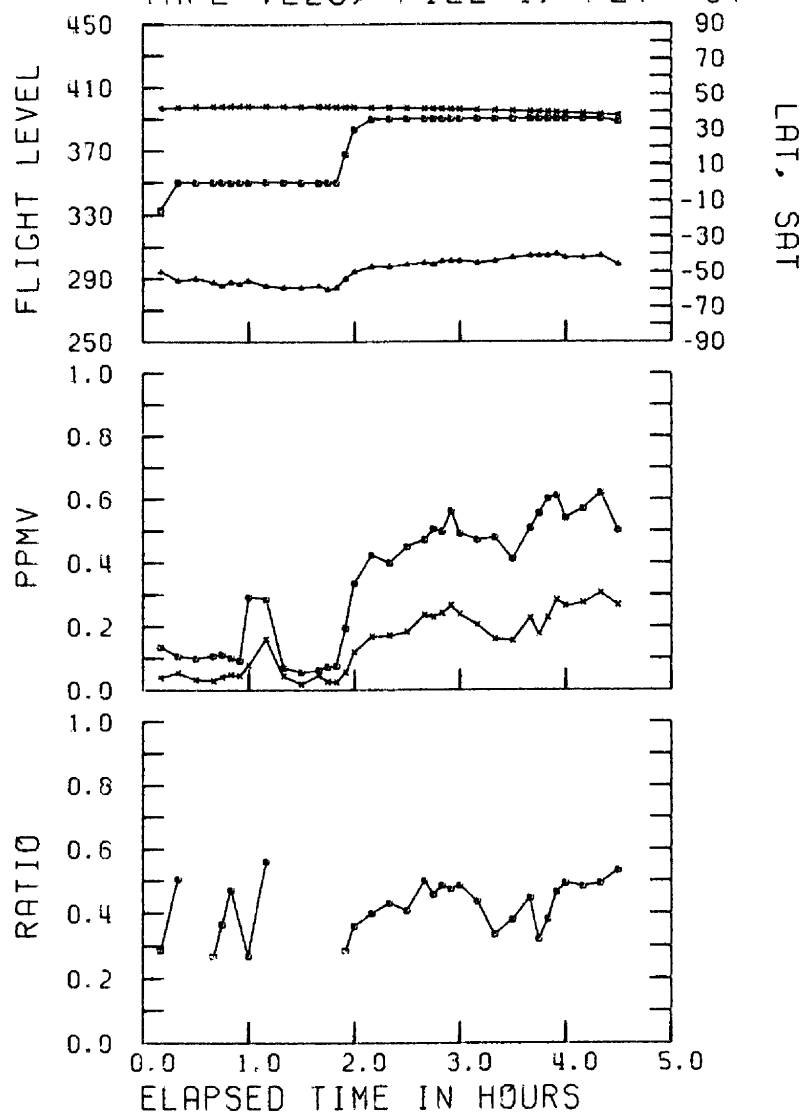


86-C

SFO TO JFK DEPARTURE 25 JAN 79
TAPE VL28, FILE 1, FLT 96

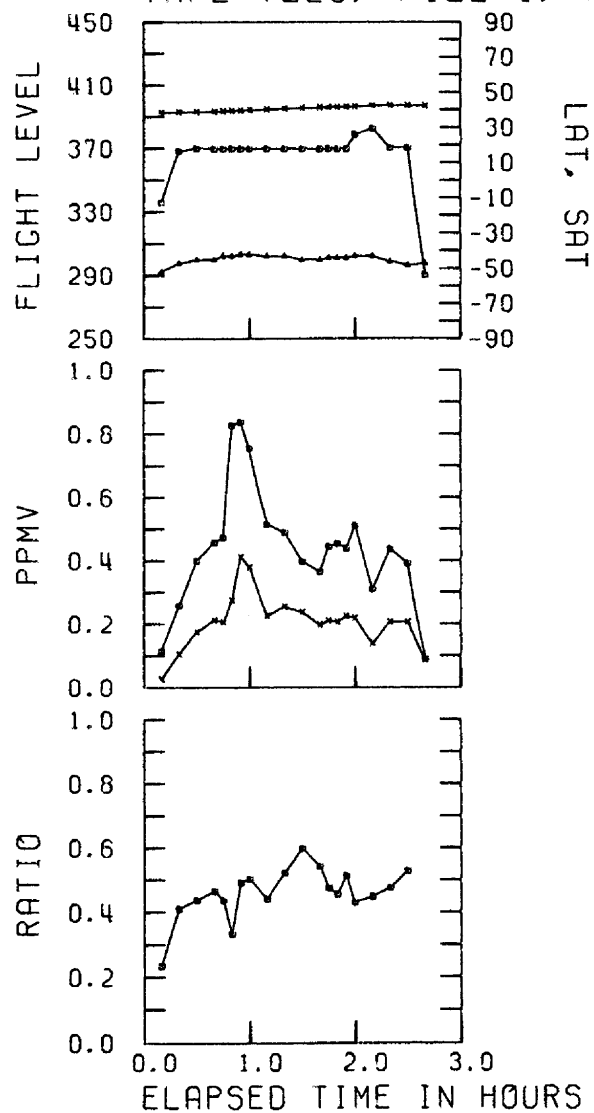


JFK TO SFO DEPARTURE 26 JAN 79
TAPE VL28, FILE 1, FLT 97

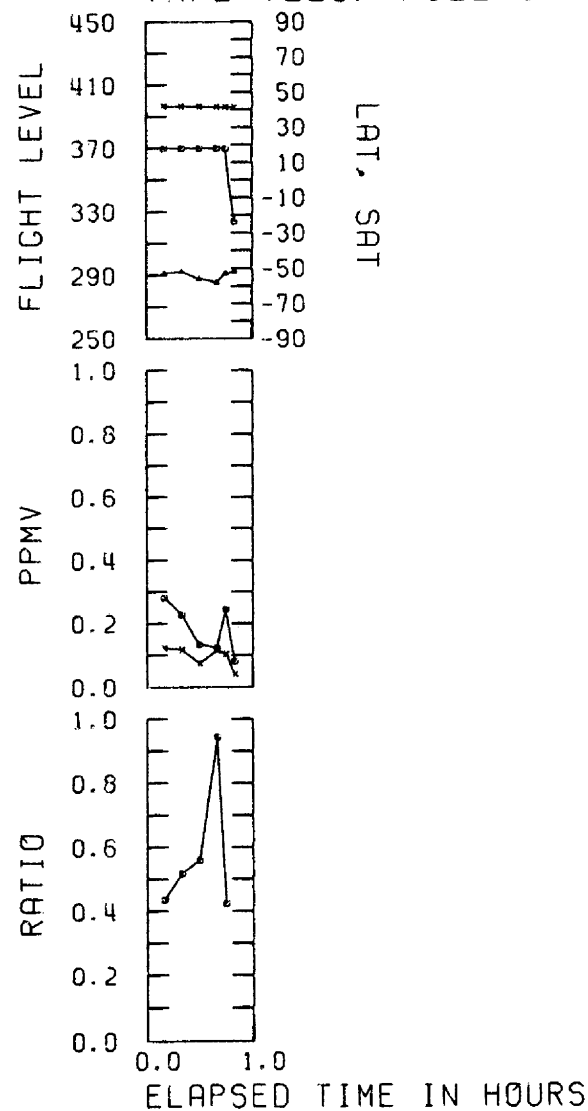


C-94

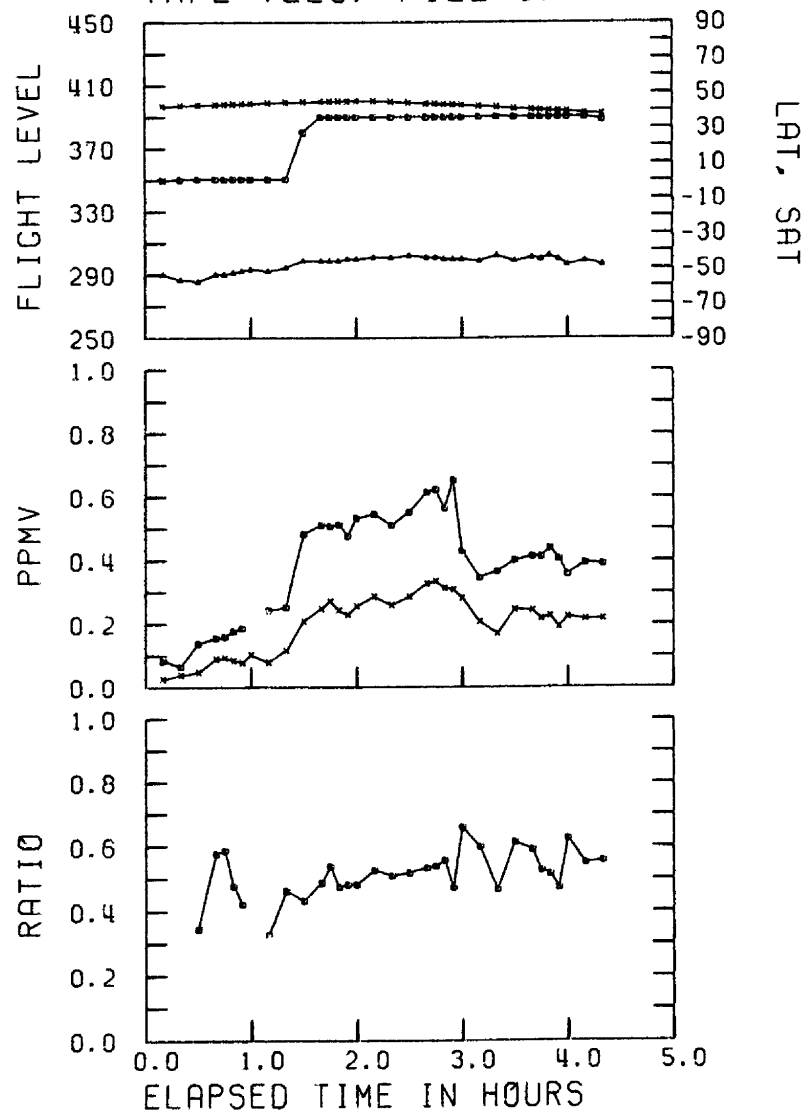
SFO TO ORD DEPARTURE 26 JAN 79
TAPE VL28, FILE 1, FLT 98



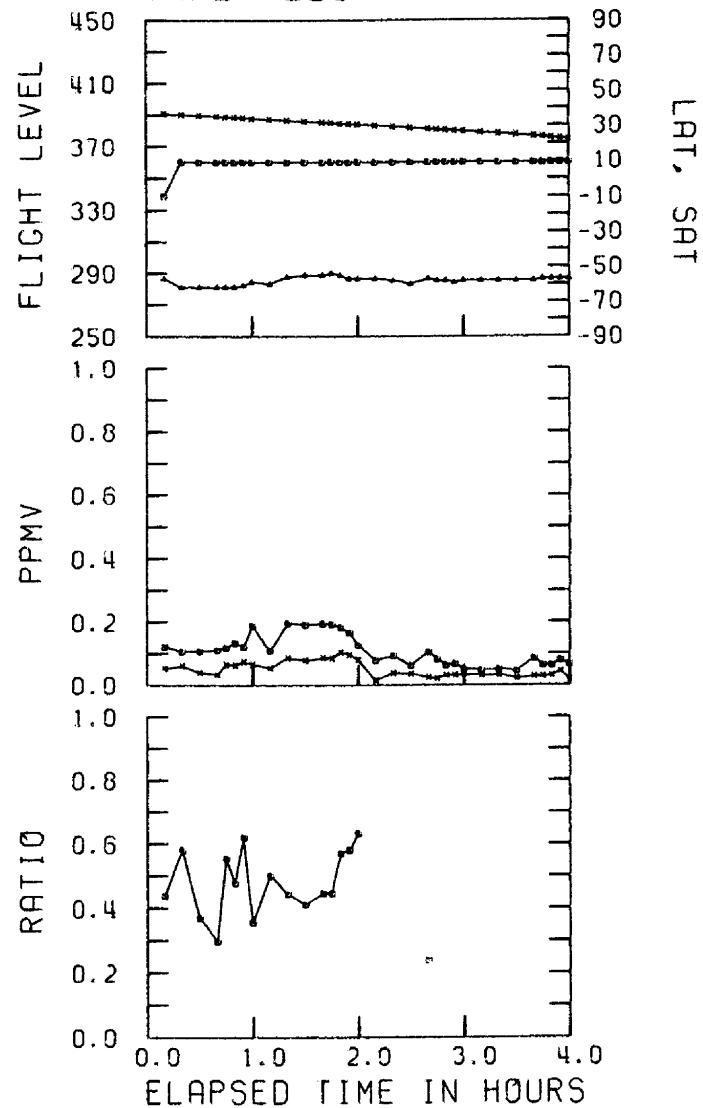
ORD TO JFK
DEPARTURE 27 JAN 79
TAPE VL28, FILE 1, FLT 99



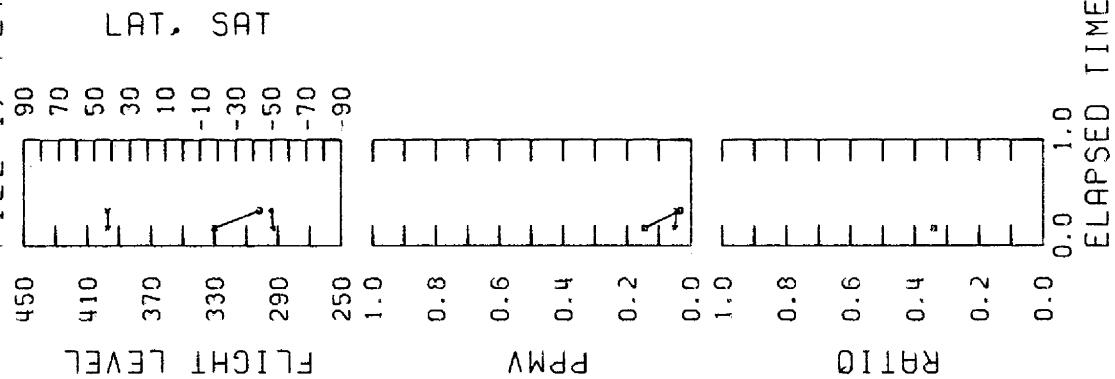
JFK TO SFO DEPARTURE 27 JAN 79
TAPE VL28, FILE 1, FLT 100



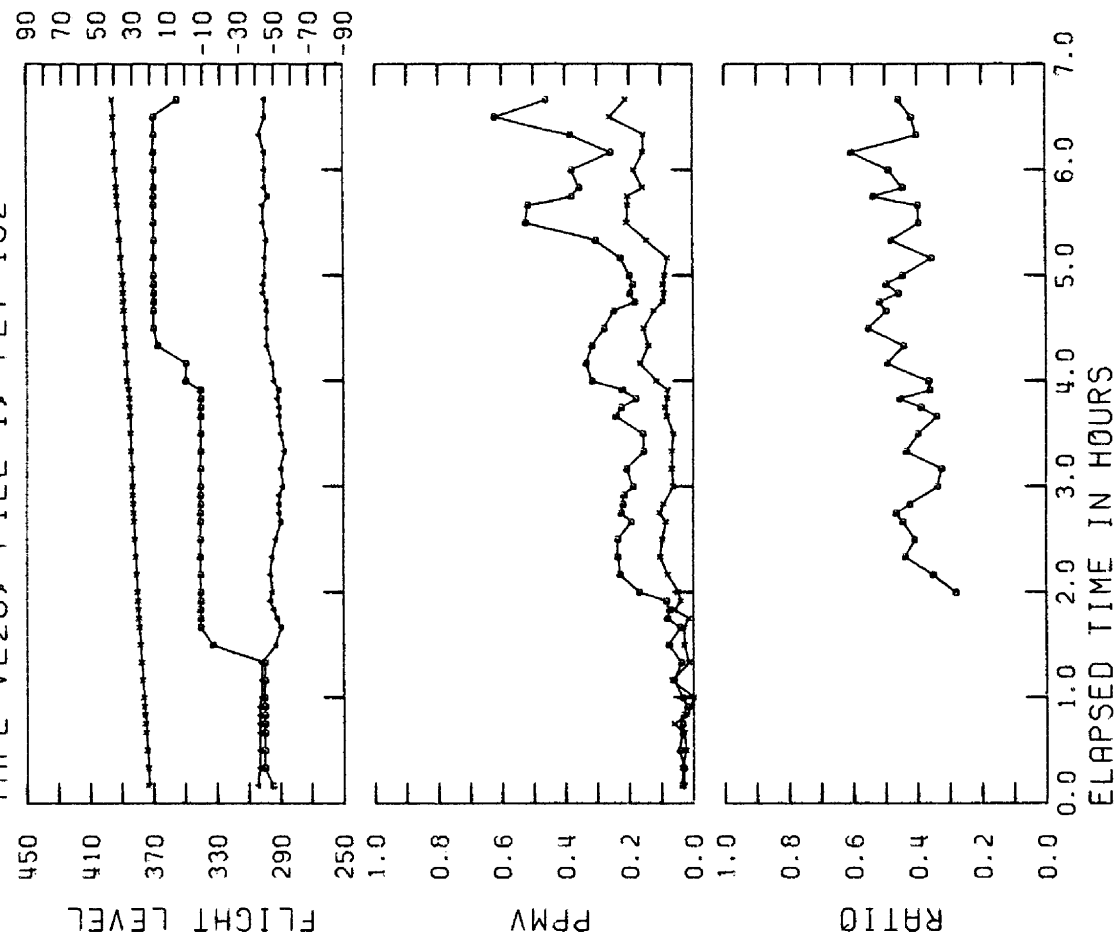
SFO TO HNL DEPARTURE 27 JAN 79
TAPE VL28, FILE 1, FLT 101



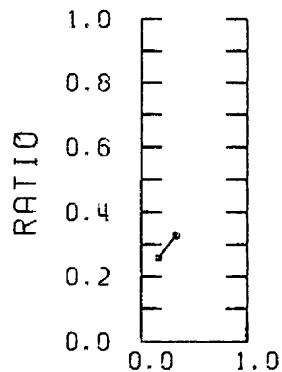
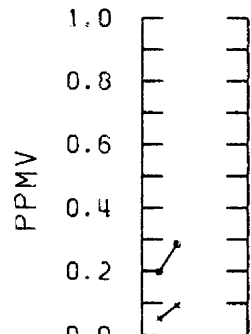
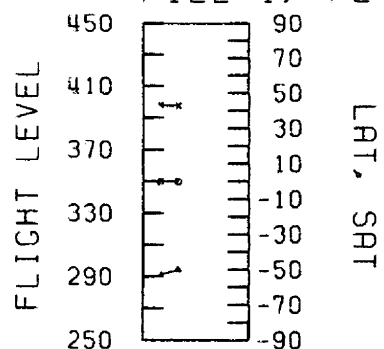
ORD TO YYZ
 DEPARTURE 28 JAN 79
 TAPE VL28,
 FILE 1, FLT 103



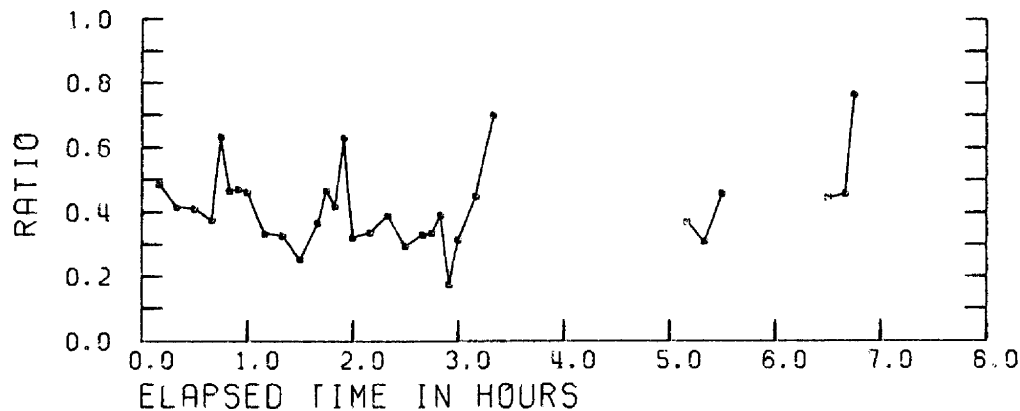
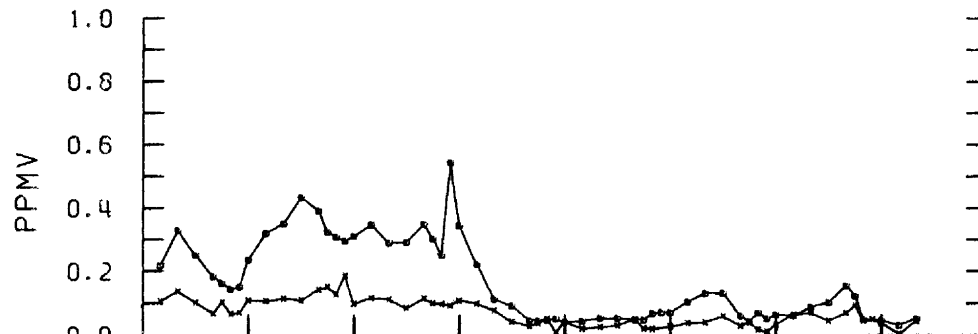
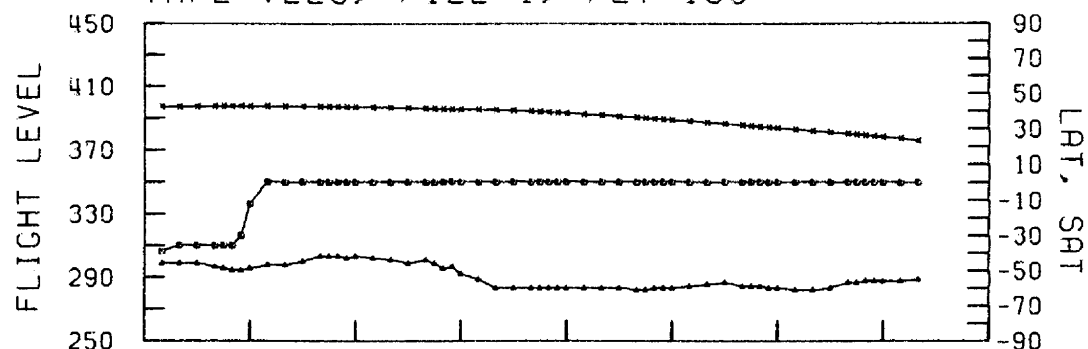
HNL TO ORD DEPARTURE 28 JAN 79
 TAPE VL28, FILE 1, FLT 102



YYZ TO ORD
DEPARTURE 28 JAN 79
TAPE VL28,
FILE 1, FLT 104

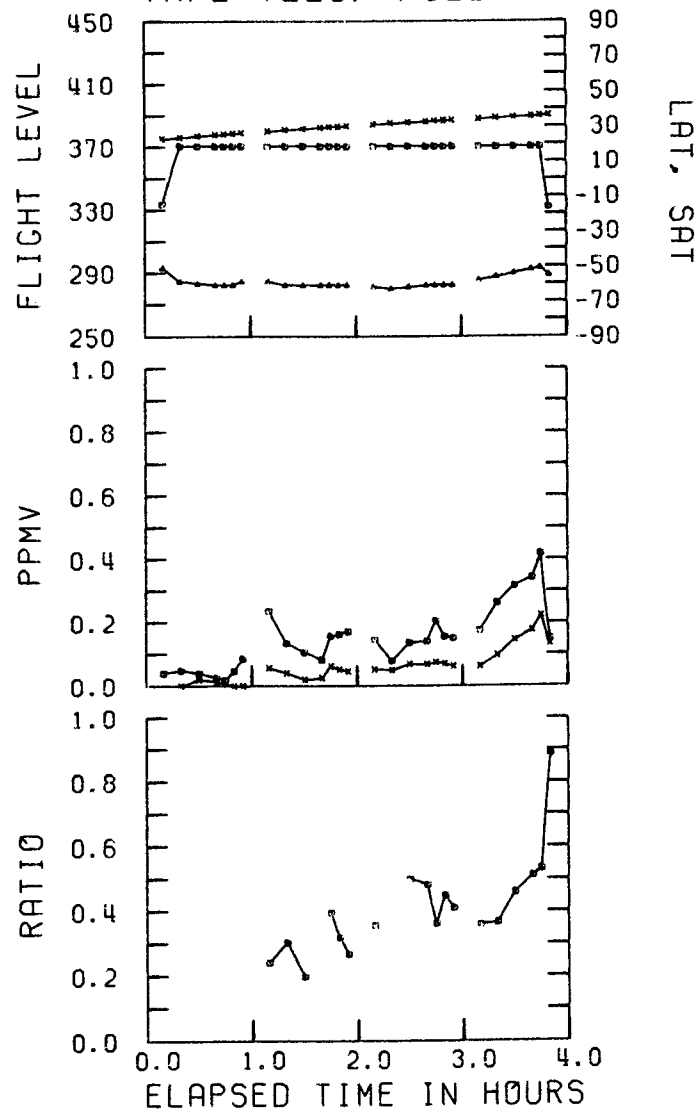


ORD TO HNL DEPARTURE 28 JAN 79
TAPE VL28, FILE 1, FLT 105

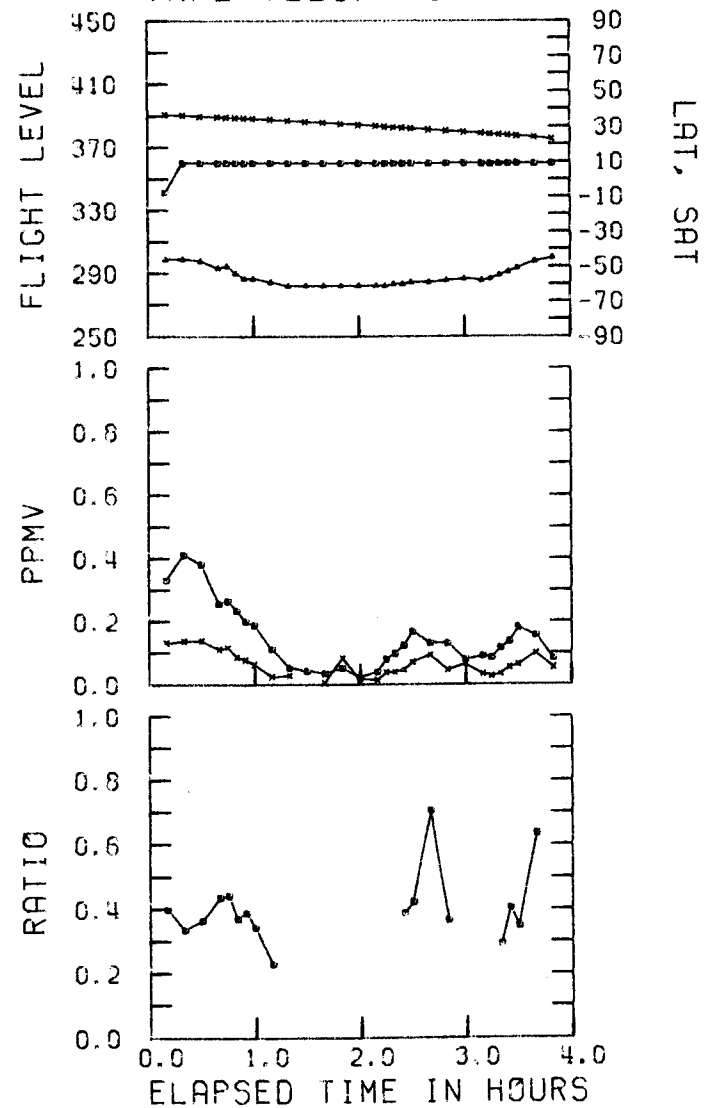


76-3

HNL TO SFO DEPARTURE 29 JAN 79
TAPE VL28, FILE 1, FLT 106



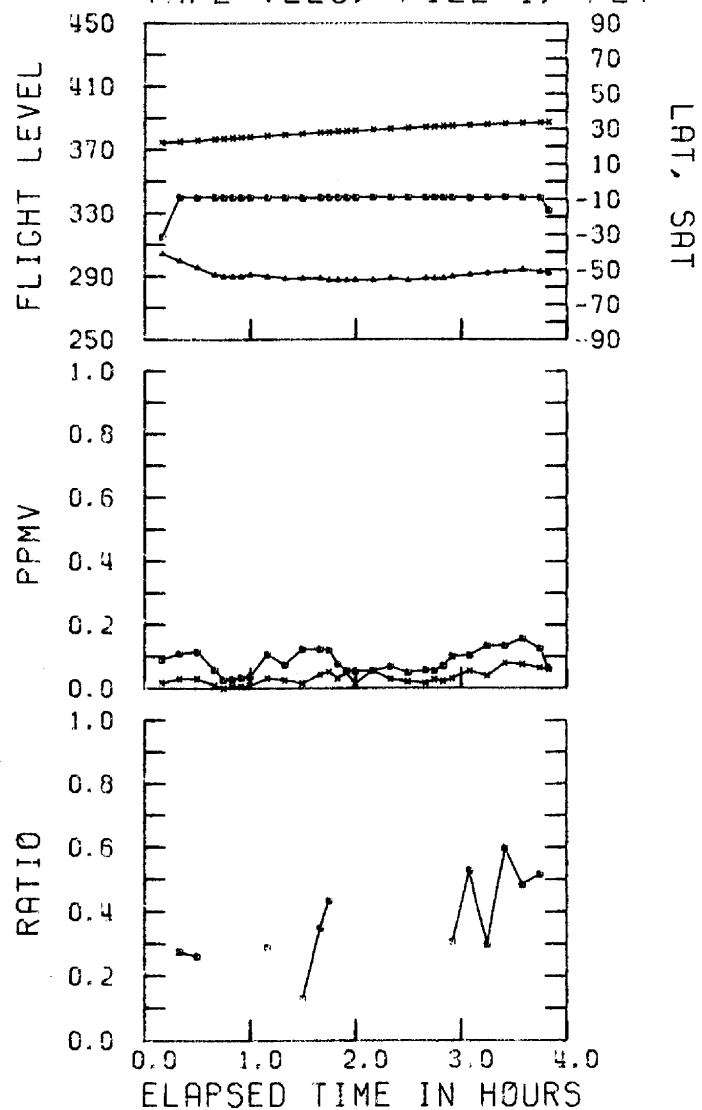
SFO TO HNL DEPARTURE 30 JAN 79
TAPE VL29, FILE 1, FLT 1



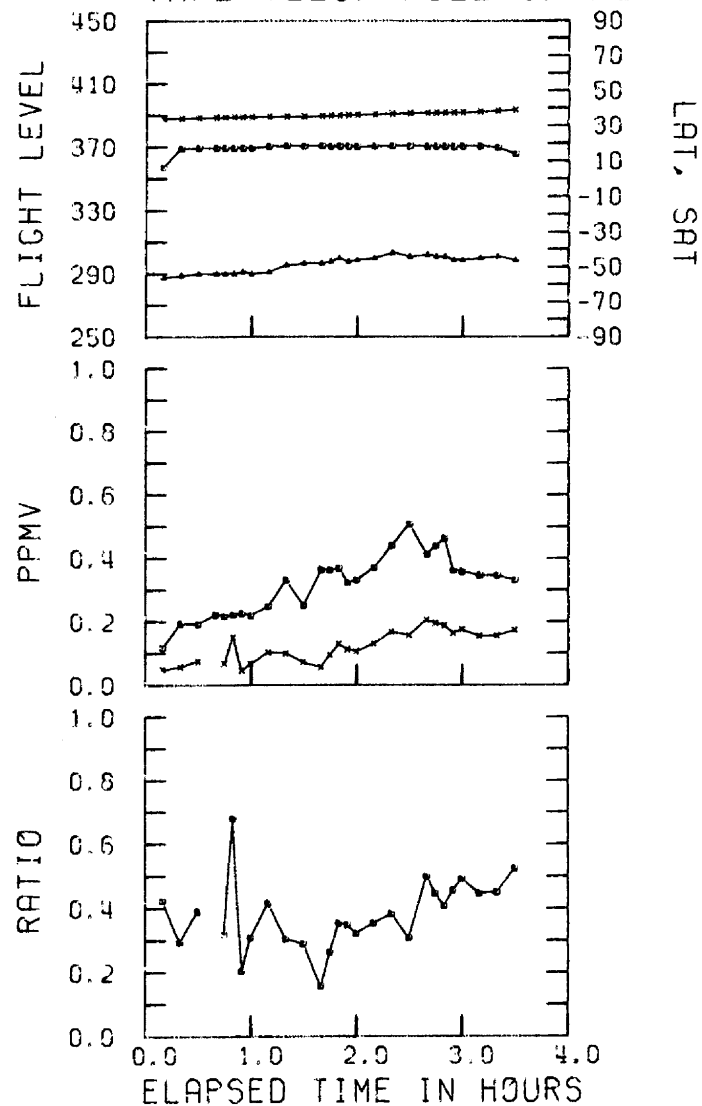
86-3

66-C

HNL TO LAX DEPARTURE 31 JAN 79
TAPE VL29, FILE 1, FLT 2

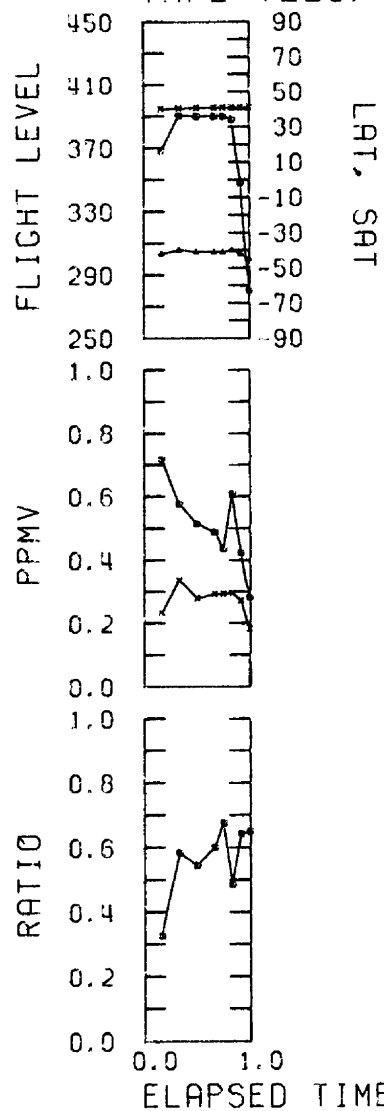


LAX TO JFK DEPARTURE 31 JAN 79
TAPE VL29, FILE 1, FLT 3

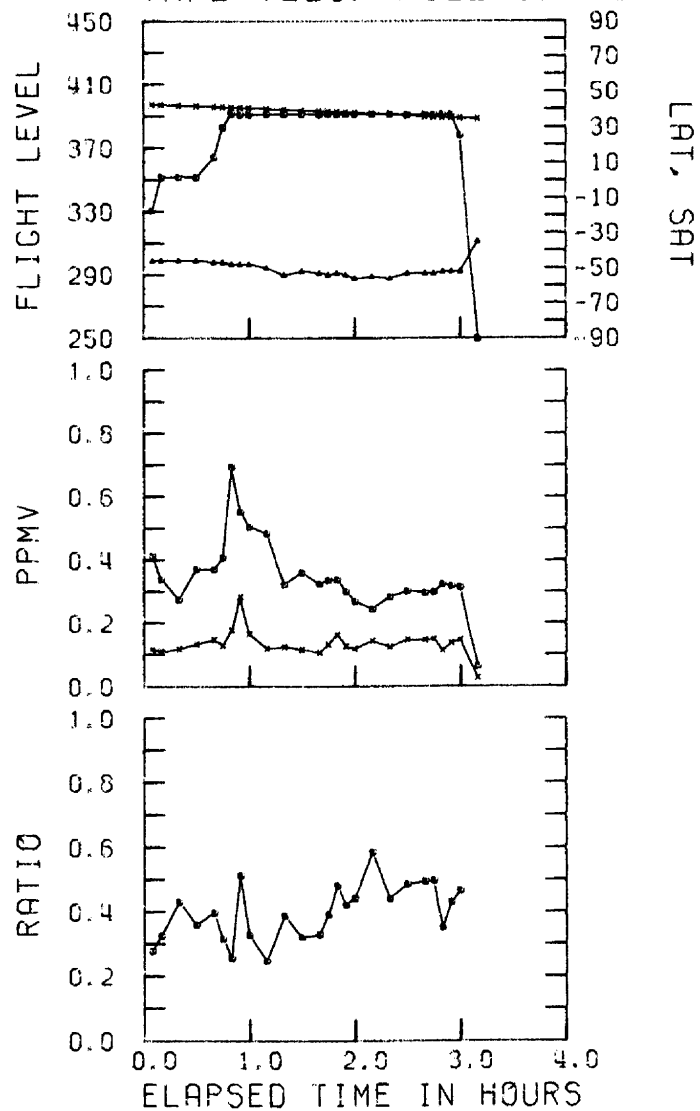


JFK TO ORD
DEPARTURE 31 JAN 79
TAPE VL29, FILE 1, FLT 4

001-3

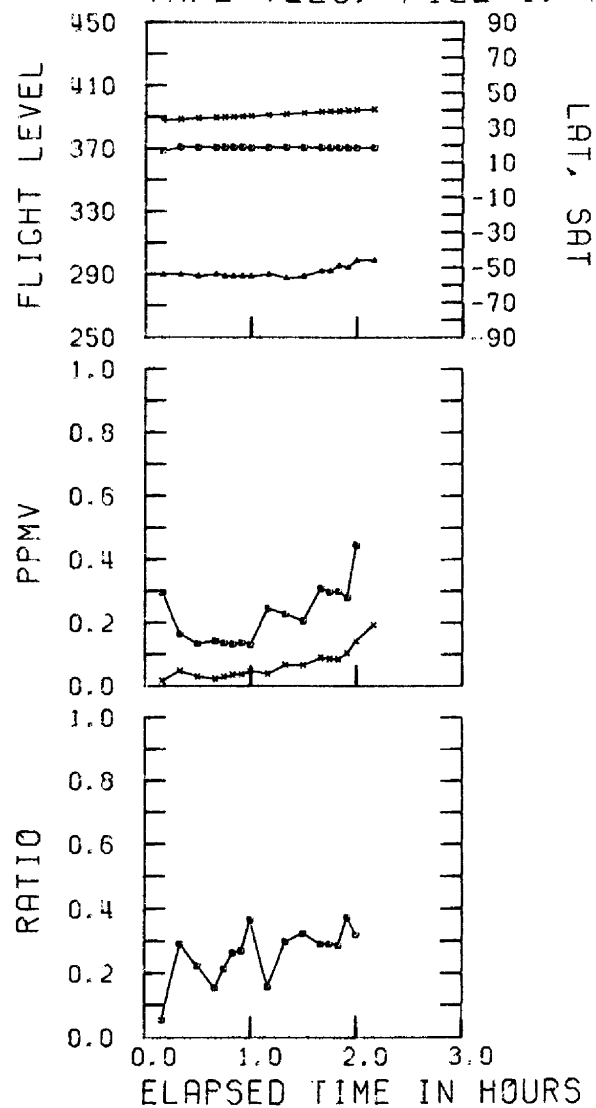


ORD TO LAX DEPARTURE 31 JAN 79
TAPE VL29, FILE 1, FLT 5

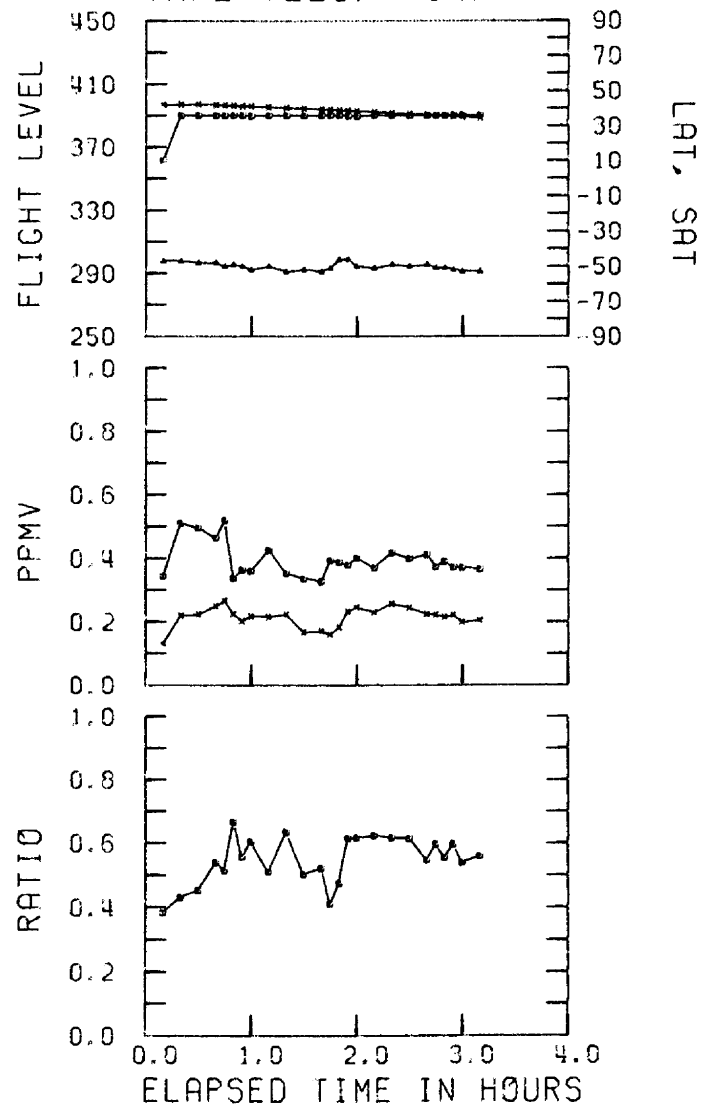


C-101

LAX TO ORD DEPARTURE 1 FEB 79
TAPE VL29, FILE 1, FLT 6

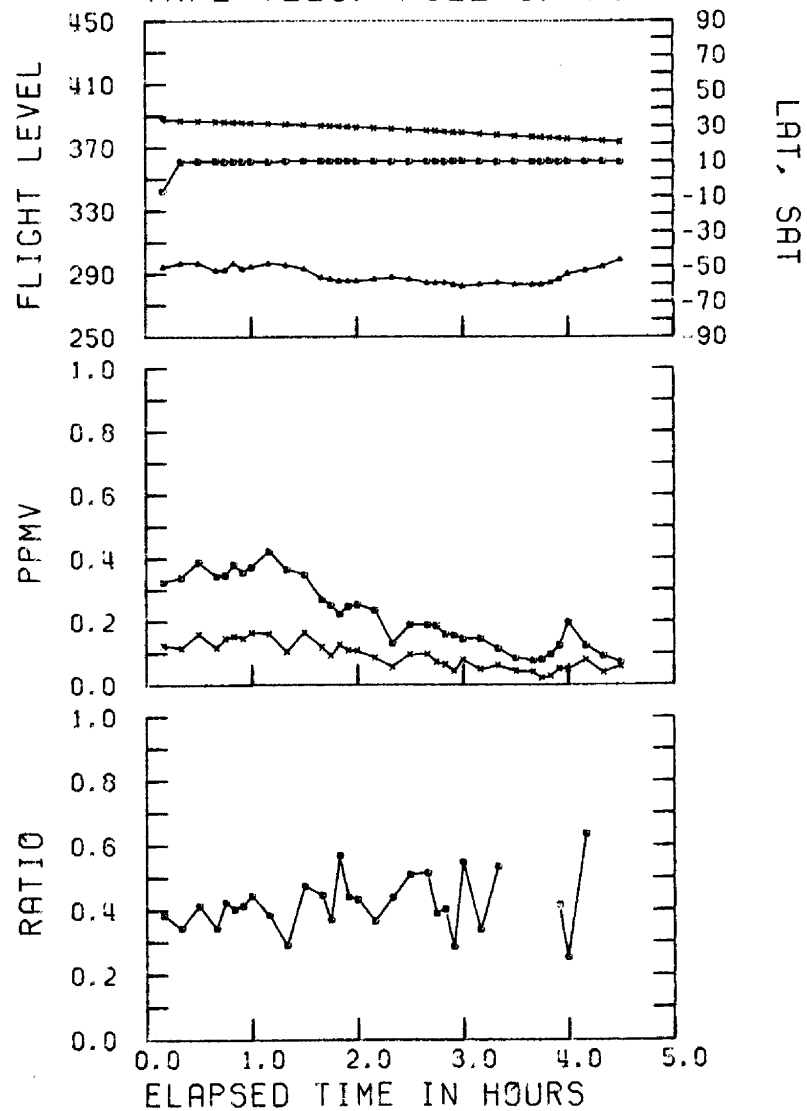


ORD TO LAX DEPARTURE 1 FEB 79
TAPE VL29, FILE 1, FLT 7

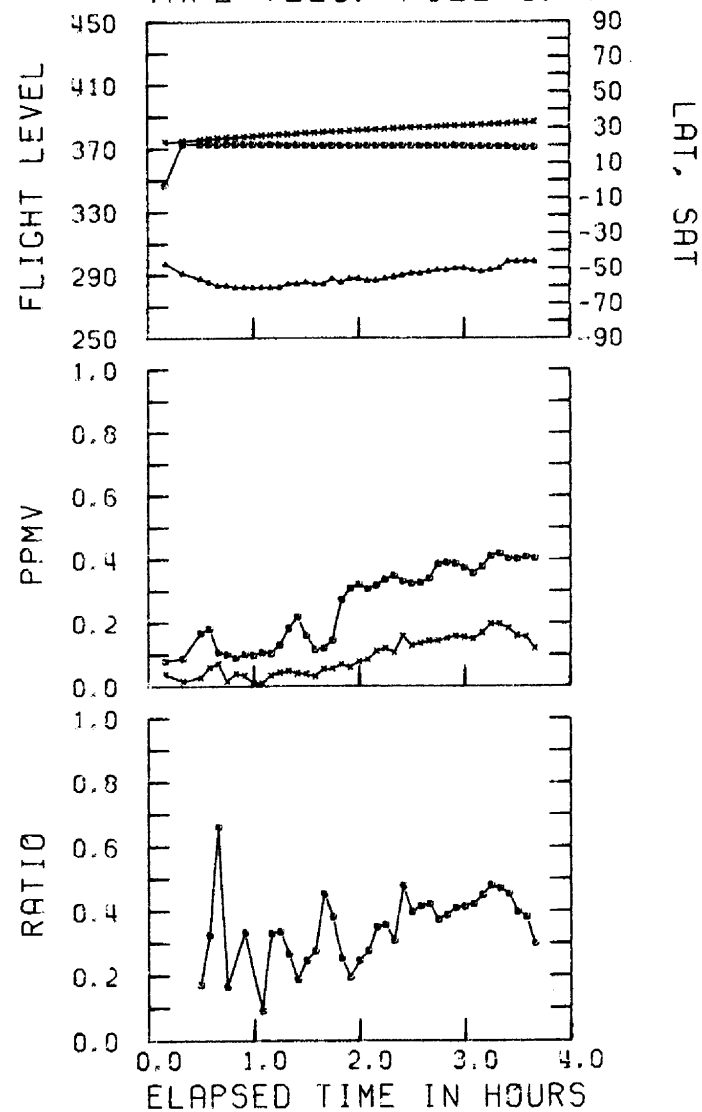


C-102

LAX TO HNL DEPARTURE 1 FEB 79
TAPE VL29, FILE 1, FLT 8

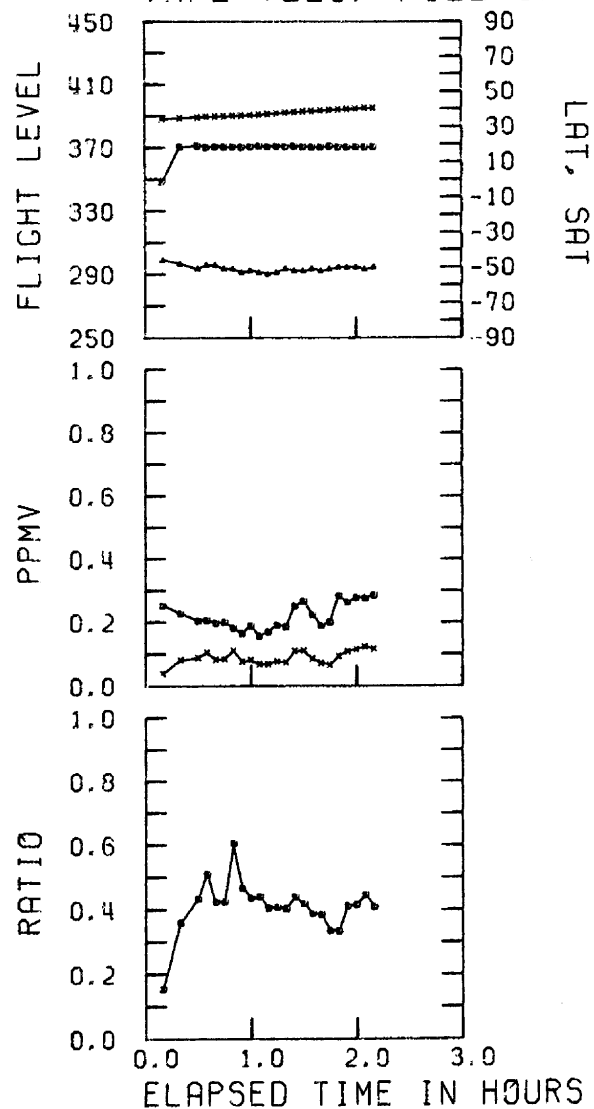


ITO TO LAX DEPARTURE 2 FEB 79
TAPE VL29, FILE 1, FLT 9

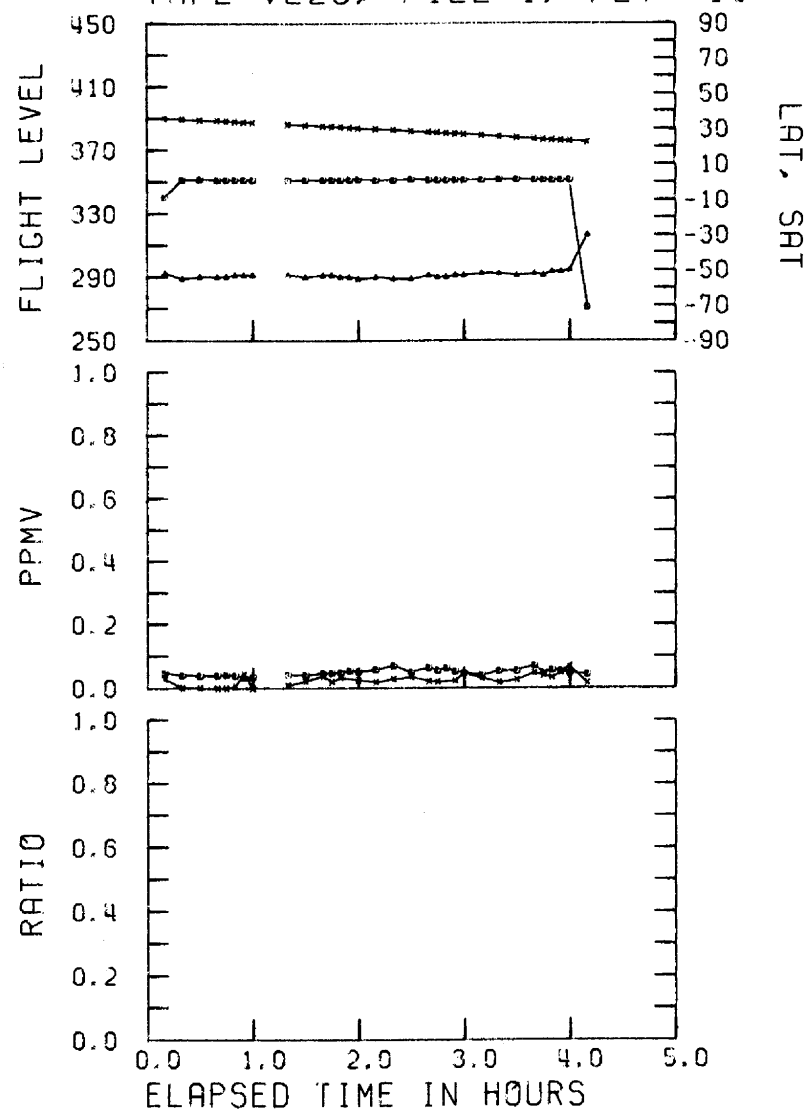


501-C

LAX TO ORD DEPARTURE 2 FEB 79
TAPE VL29, FILE 1, FLT 10

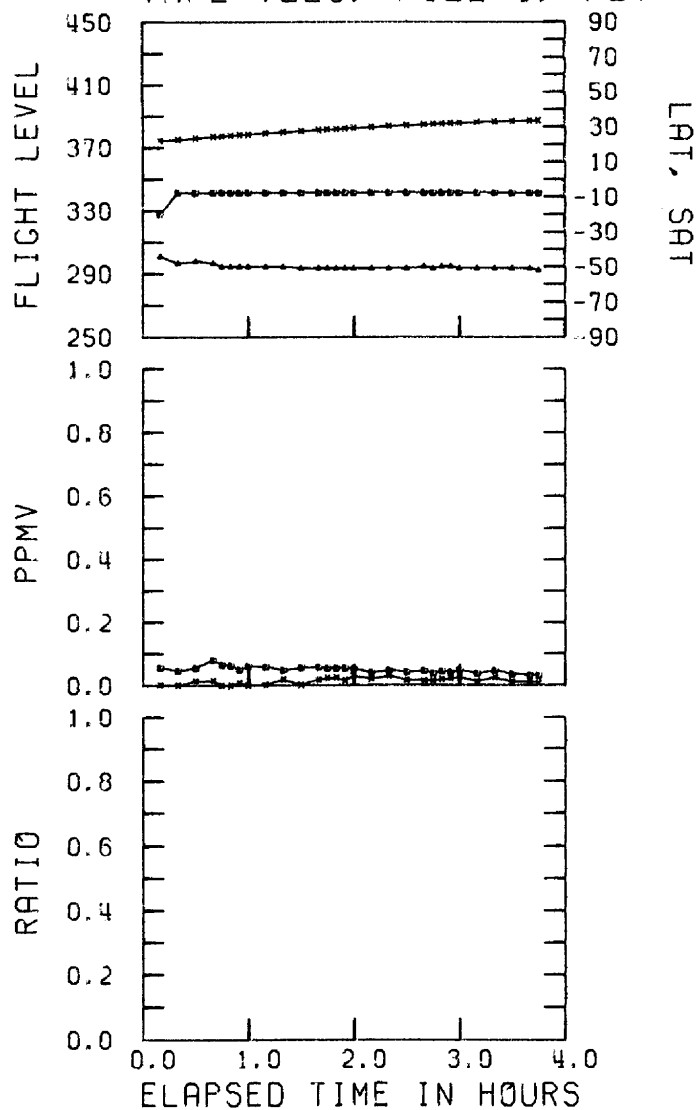


SFO TO HNL DEPARTURE 7 FEB 79
TAPE VL29, FILE 1, FLT 11

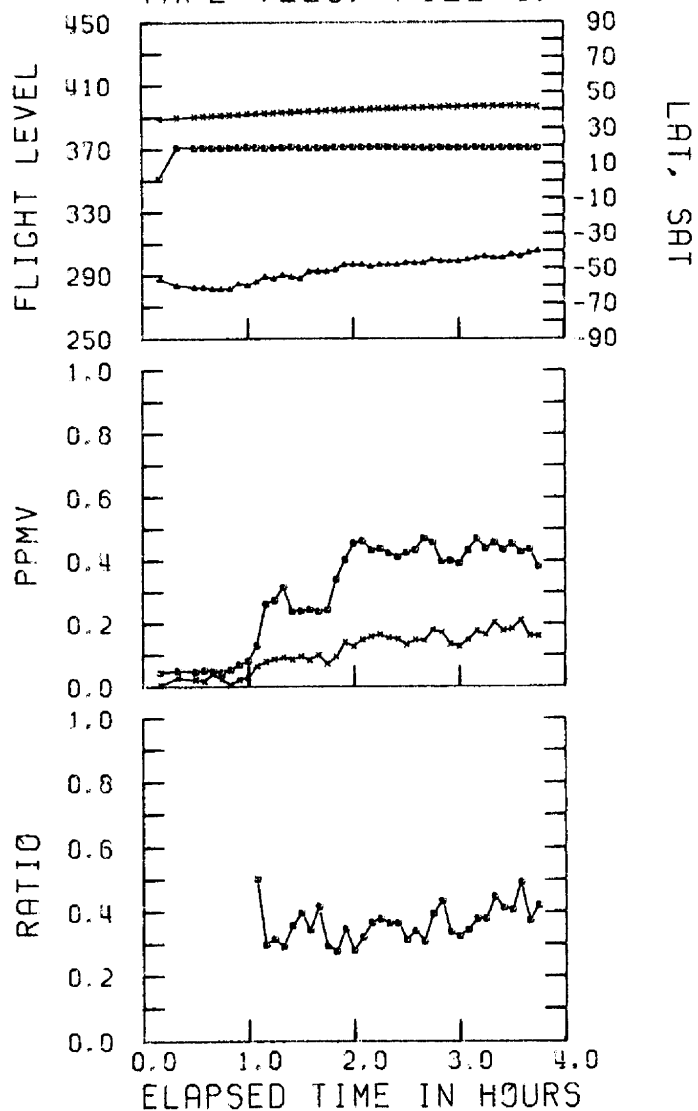


C-104

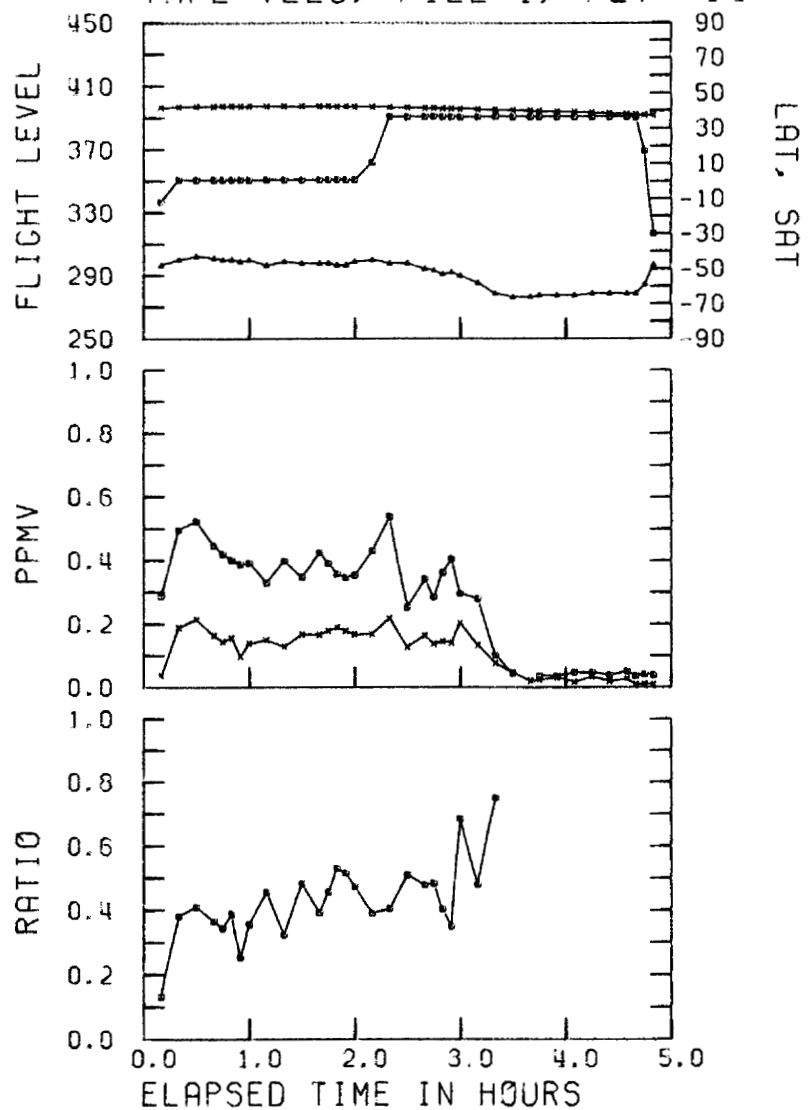
HNL TO LAX DEPARTURE 8 FEB 79
TAPE VL29, FILE 1, FLT 12



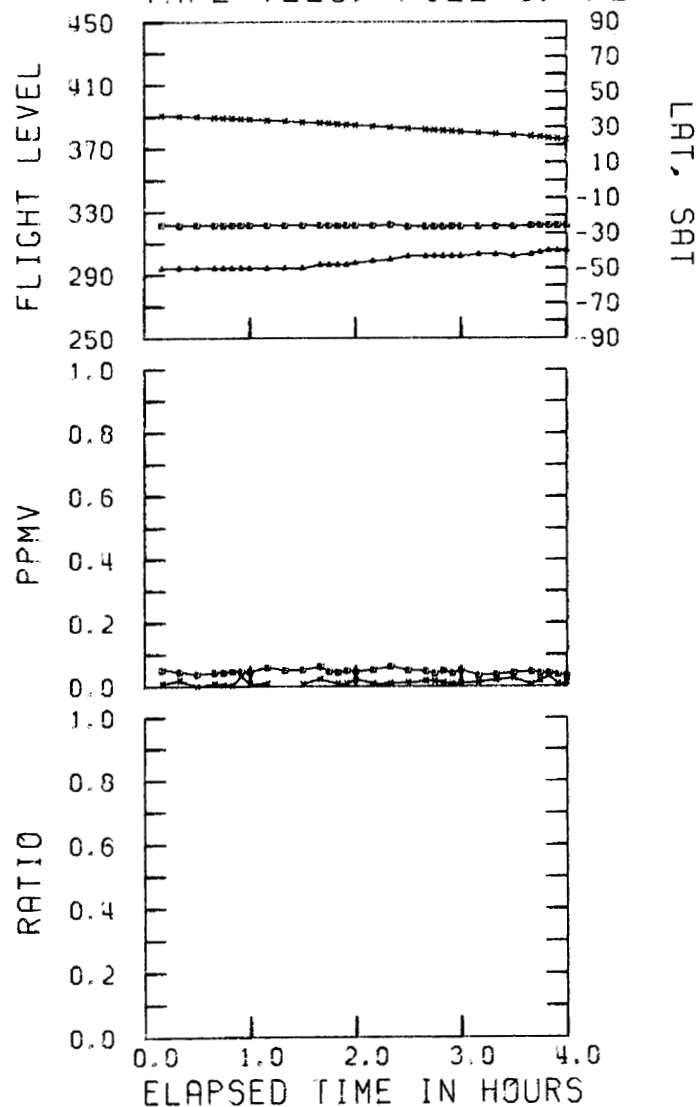
LAX TO JFK DEPARTURE 8 FEB 79
TAPE VL29, FILE 1, FLT 13



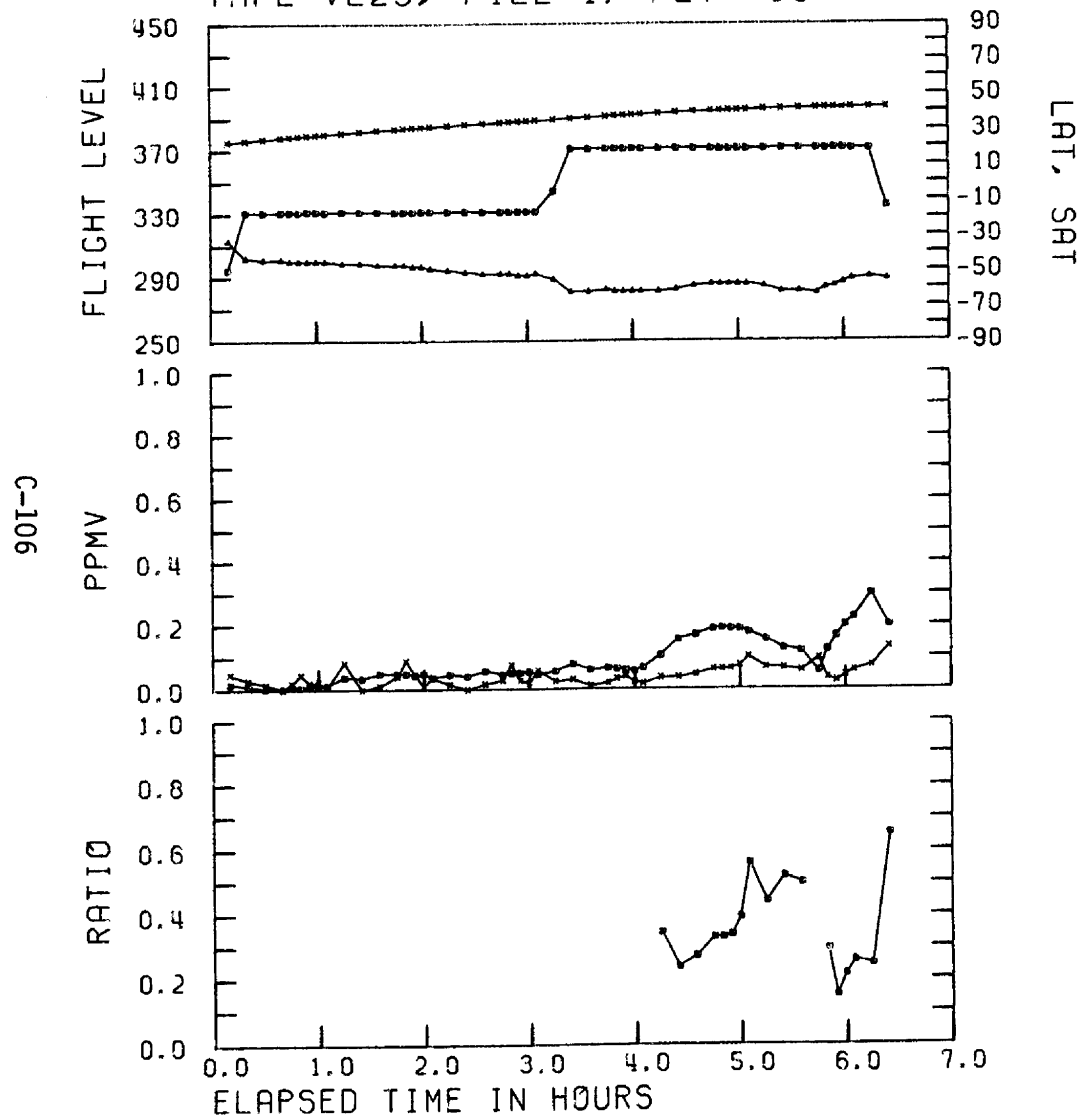
JFK TO SFO DEPARTURE 8 FEB 79
TAPE VL29, FILE 1, FLT 14



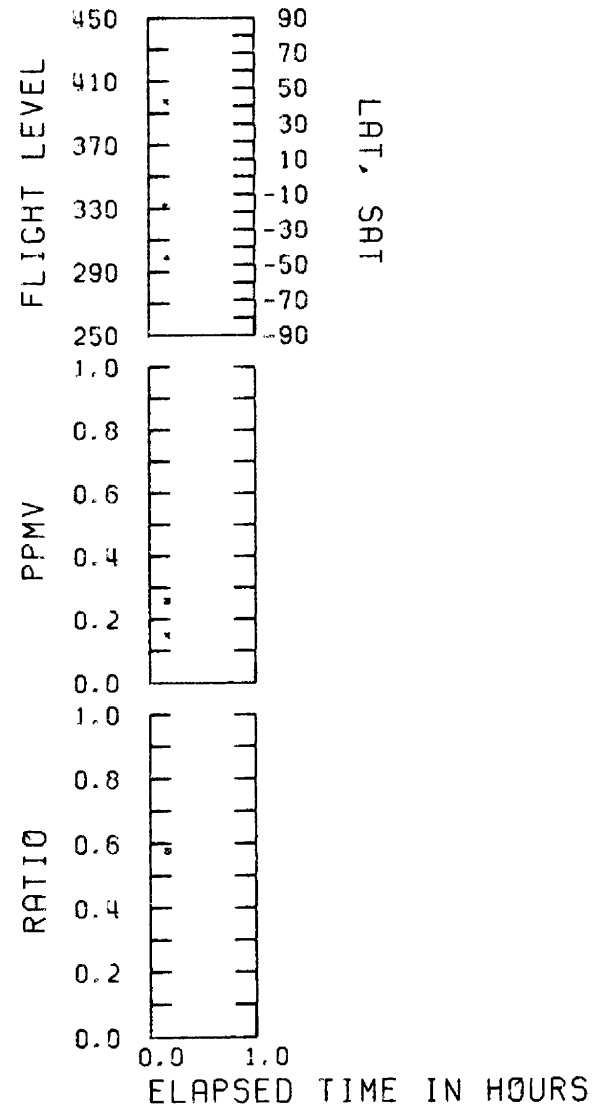
SFO TO HNL DEPARTURE 8 FEB 79
TAPE VL29, FILE 1, FLT 15



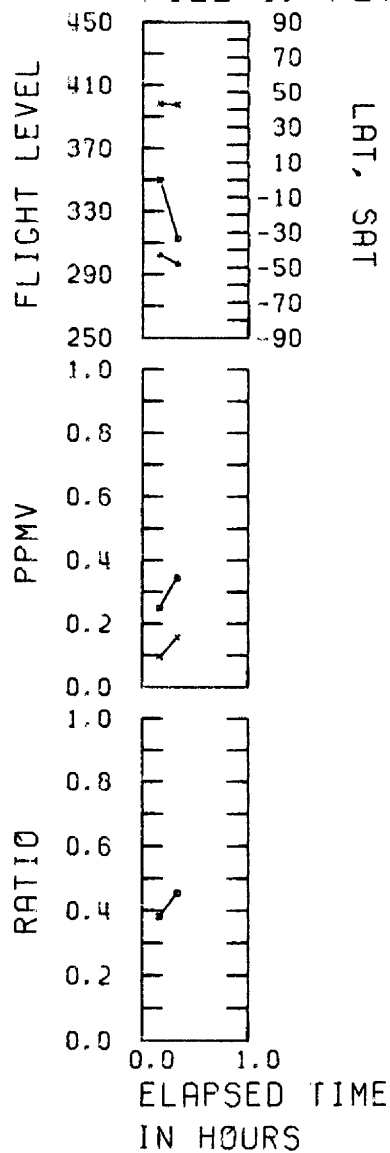
HNL TO ORD DEPARTURE 9 FEB 79
TAPE VL29, FILE 1, FLT 16



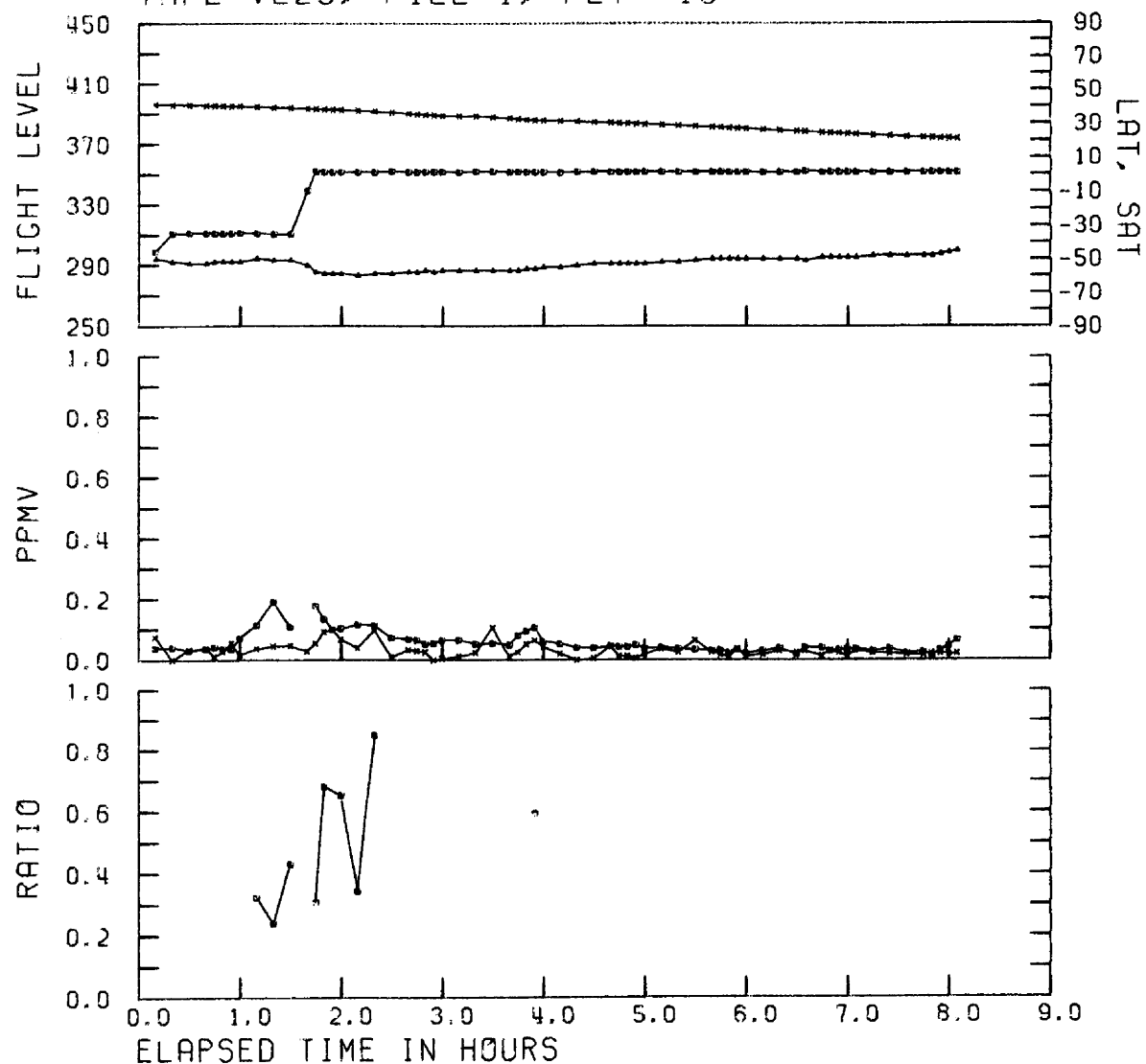
ORD TO YYZ
DEPARTURE 9 FEB 79
TAPE VL29,
FILE 1, FLT 17



YYZ TO ORD
DEPARTURE
9 FEB 79
TAPE VL29,
FILE 1, FLT 18

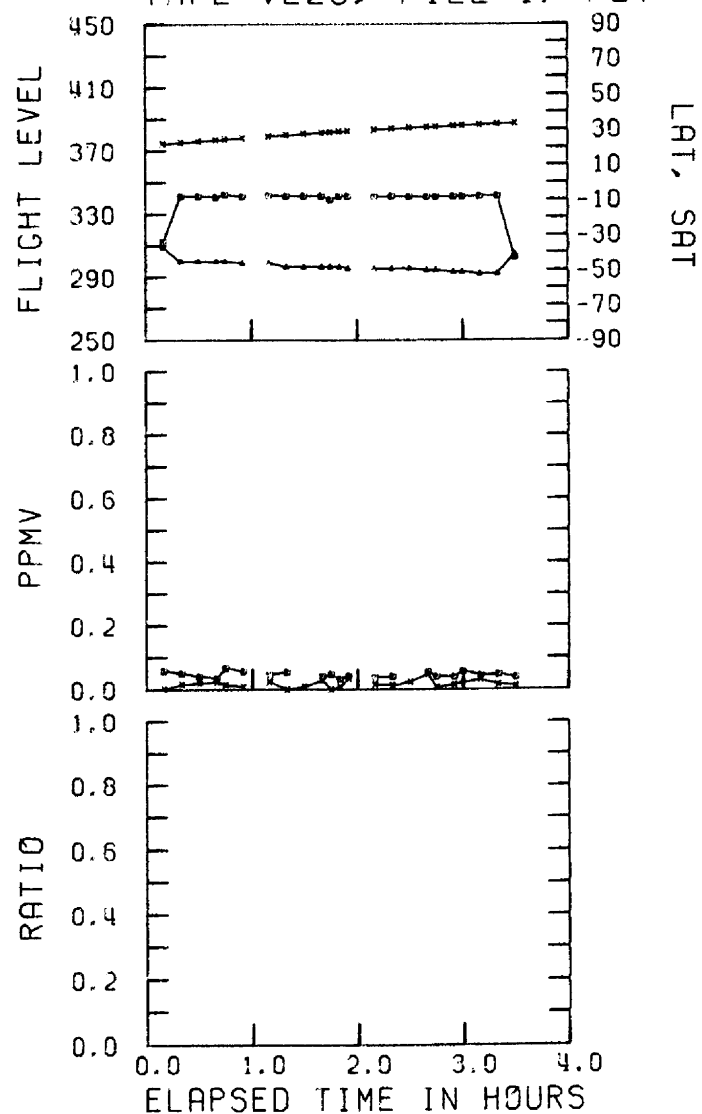


ORD TO HNL DEPARTURE 9 FEB 79
TAPE VL29, FILE 1, FLT 19

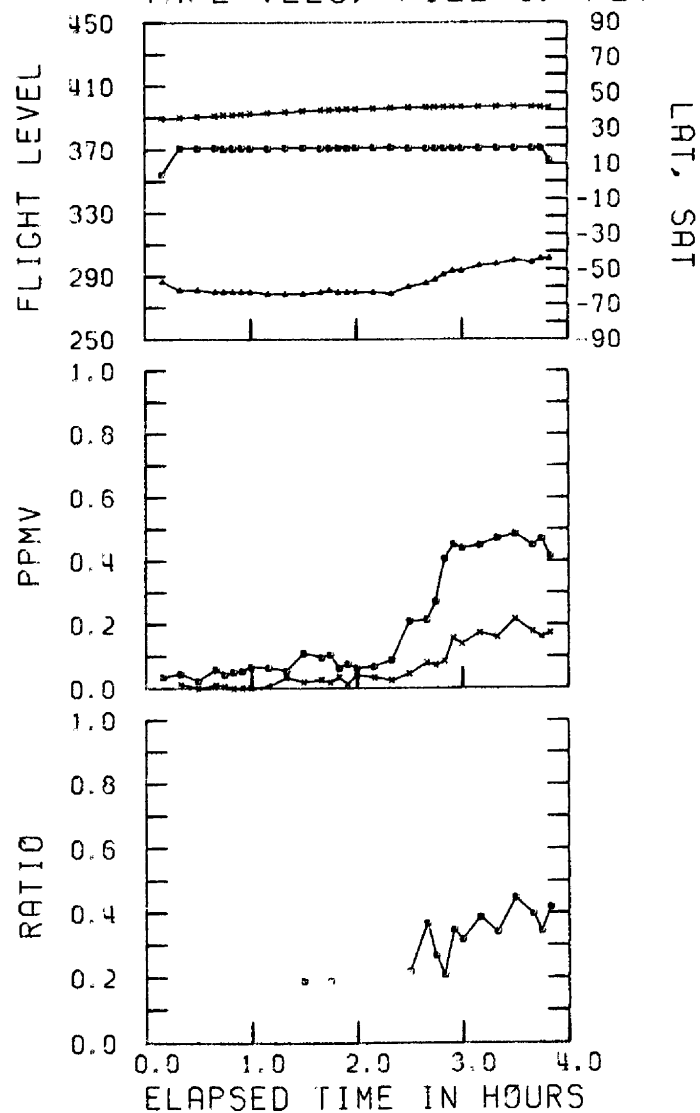


C-108

HNL TO LAX DEPARTURE 10 FEB 79
TAPE VL29, FILE 1, FLT 20

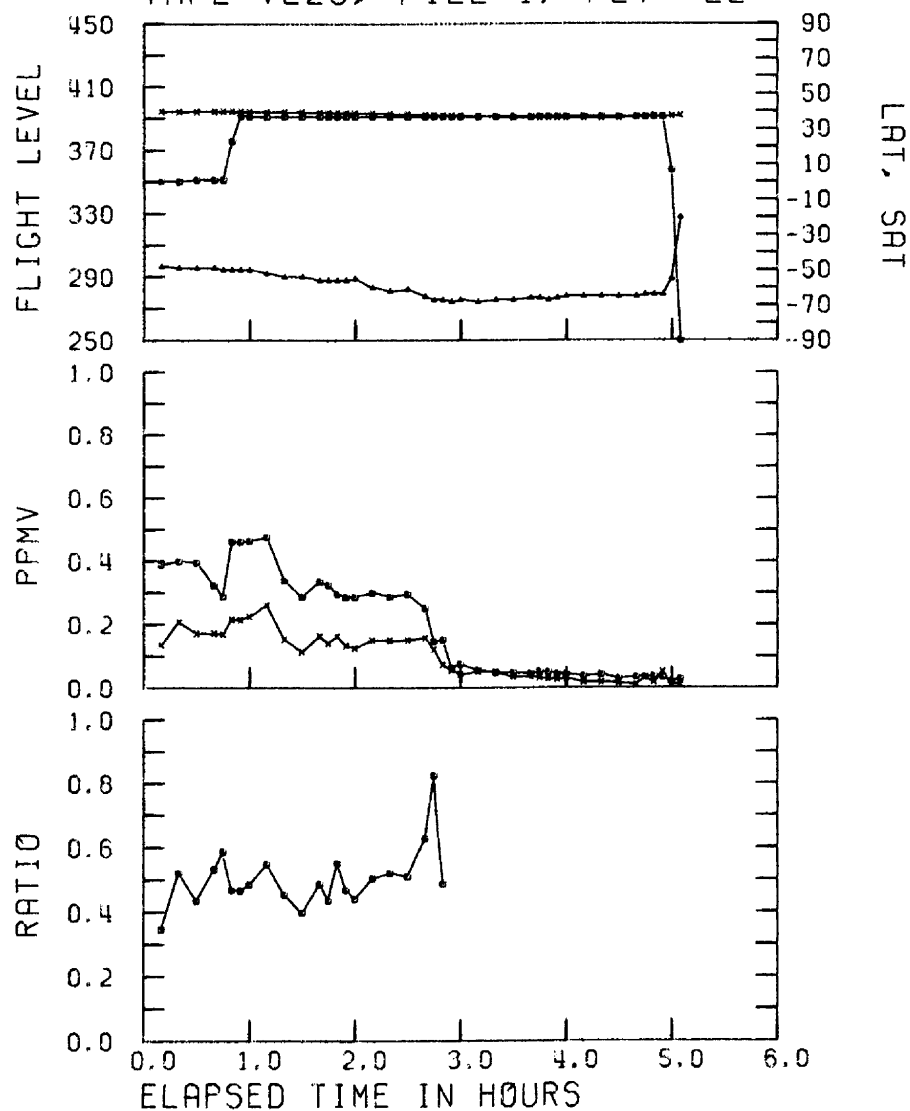


LAX TO JFK DEPARTURE 10 FEB 79
TAPE VL29, FILE 1, FLT 21

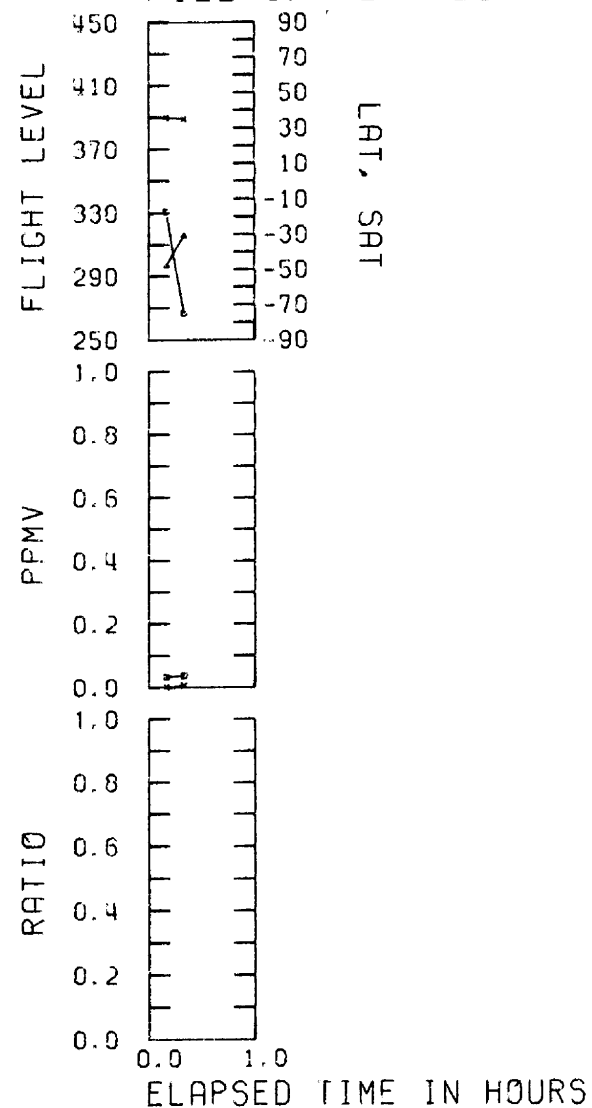


601-C

JFK TO SFO DEPARTURE 10 FEB 79
TAPE VL29, FILE 1, FLT 22

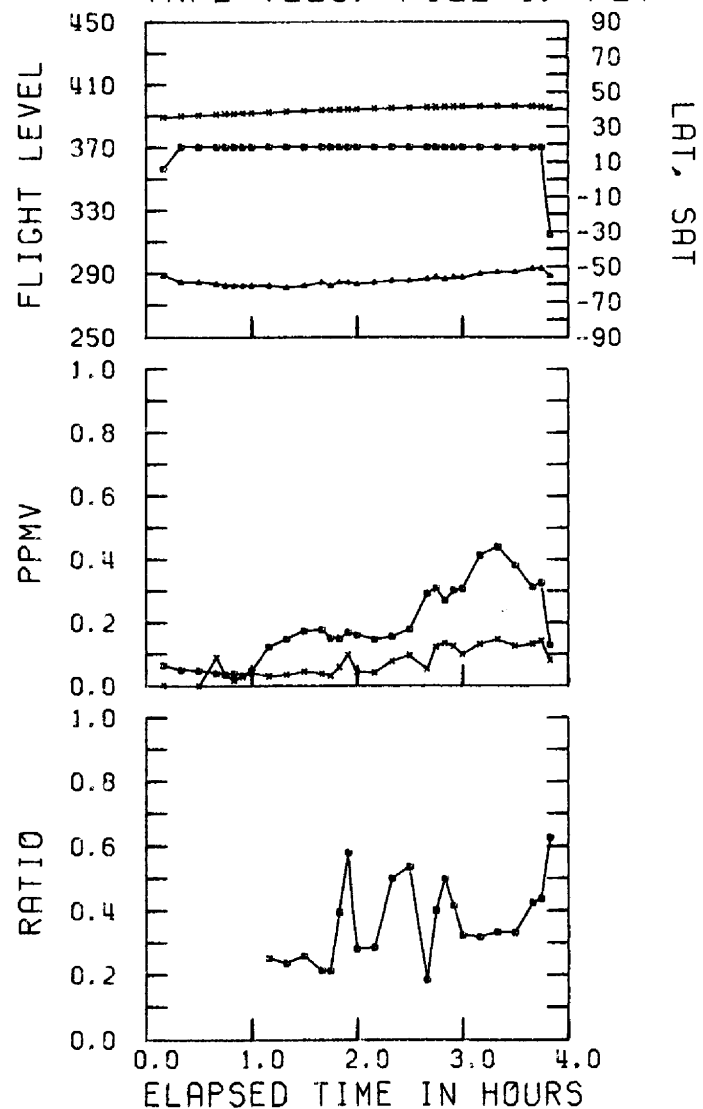


SFO TO LAX
DEPARTURE 11 FEB 79
TAPE VL29,
FILE 1, FLT 23

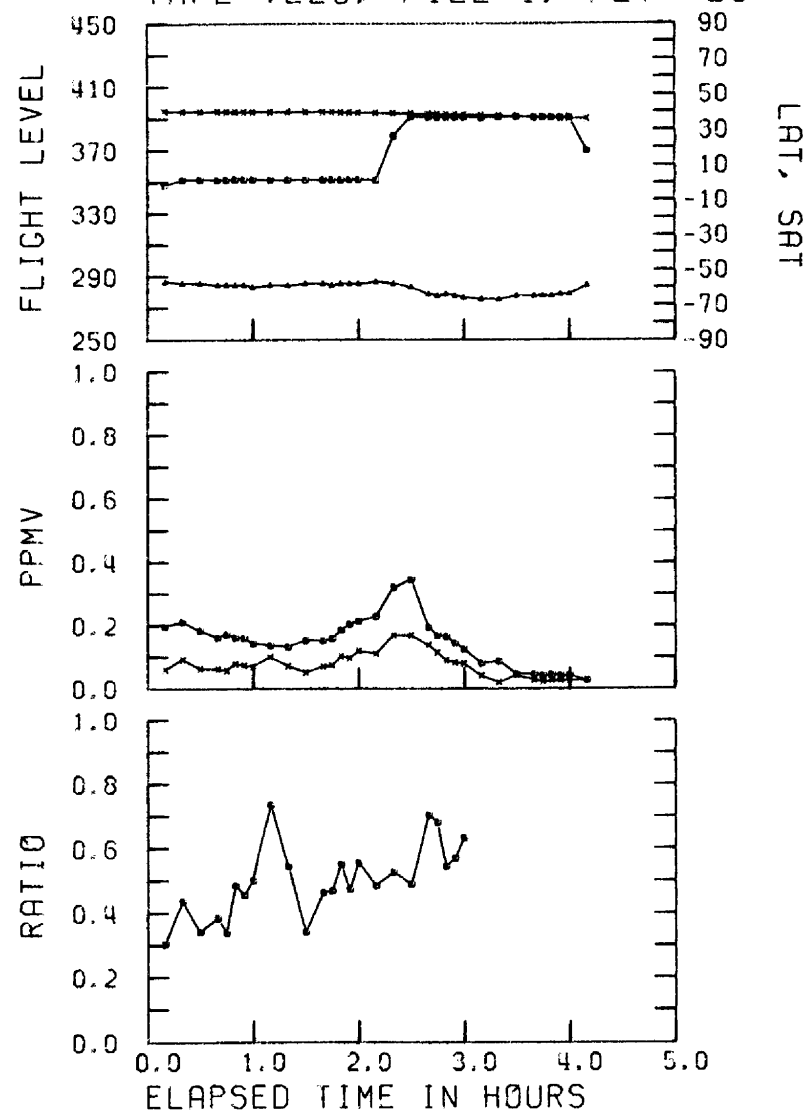


LAX TO JFK DEPARTURE 11 FEB 79
TAPE VL29, FILE 1, FLT 24

C-110

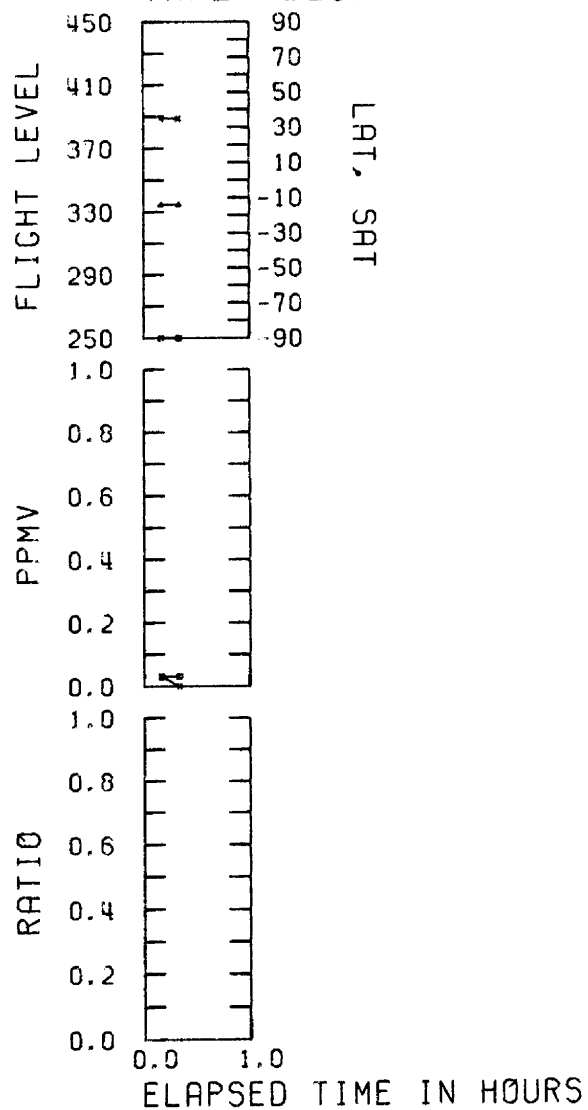


JFK TO LAS DEPARTURE 12 FEB 79
TAPE VL29, FILE 1, FLT 25

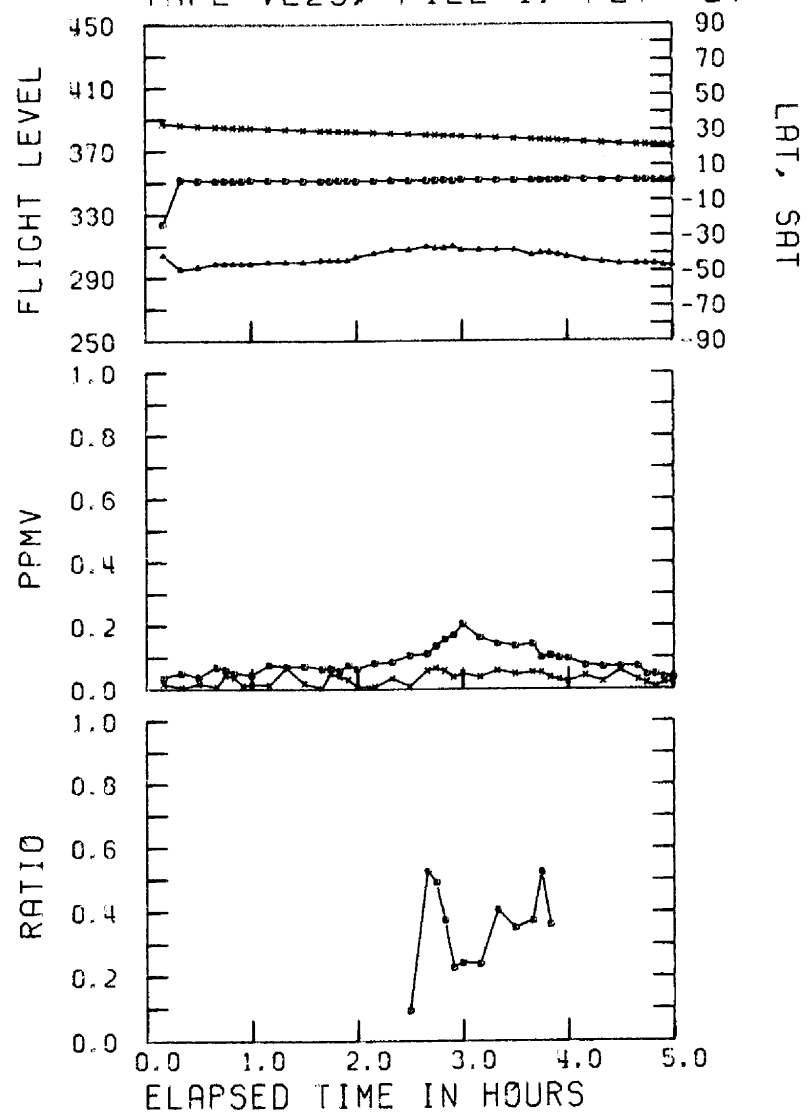


LAS TO LAX
 DEPARTURE 12 FEB 79
 TAPE VL29, FILE 1, FLT 26

C-111

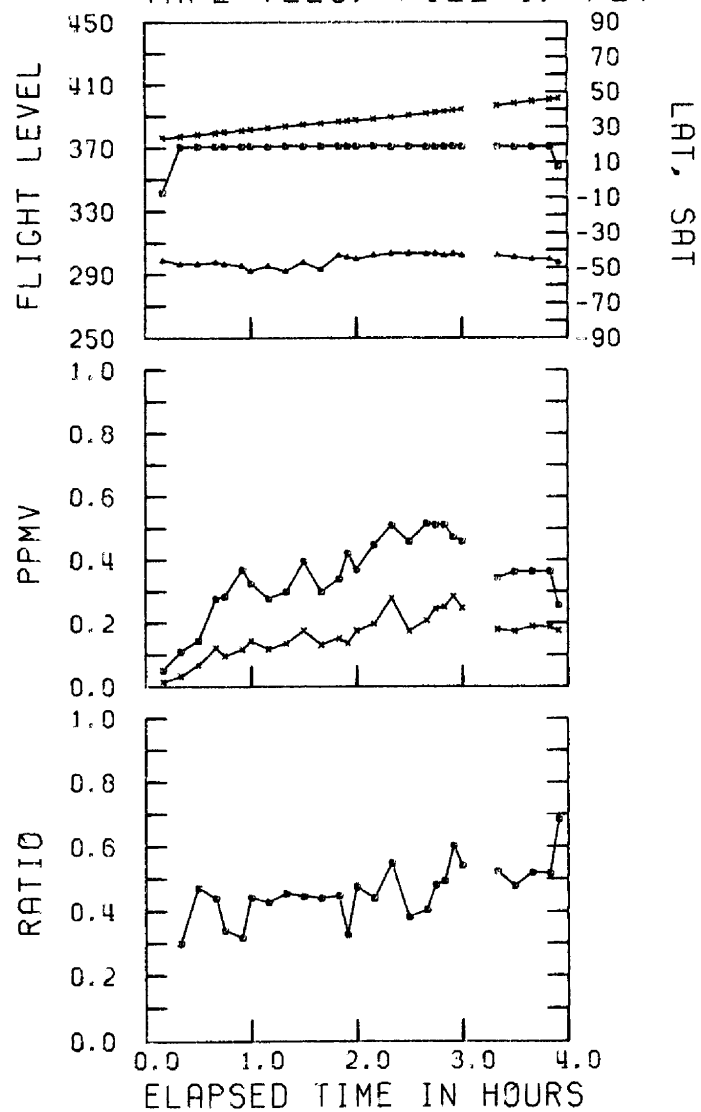


LAX TO HNL DEPARTURE 12 FEB 79
 TAPE VL29, FILE 1, FLT 27

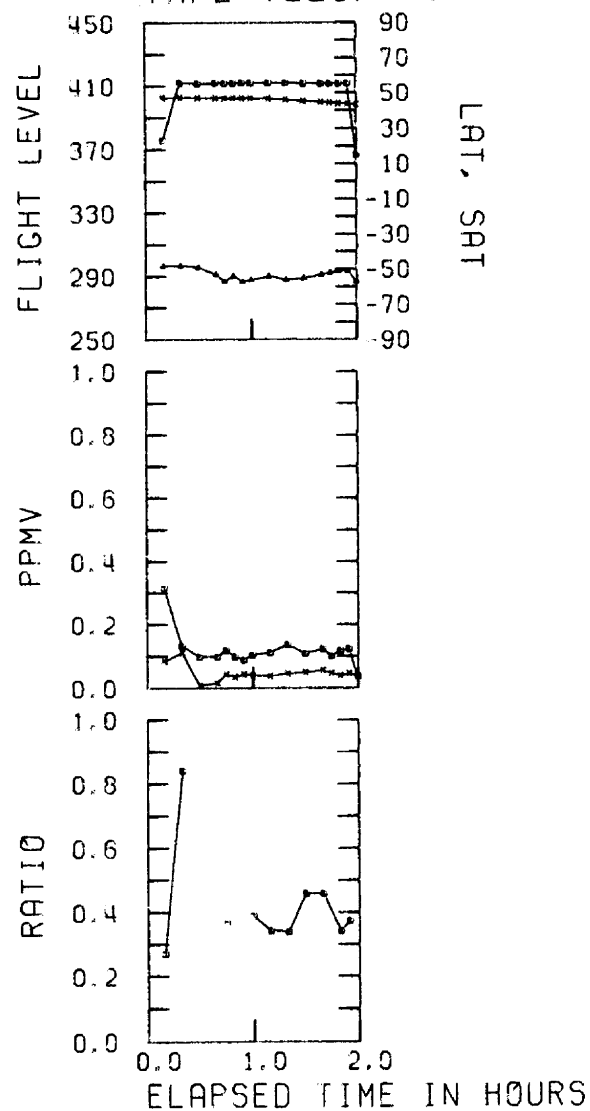


C-112

HNL TO SEA DEPARTURE 13 FEB 79
TAPE VL29, FILE 1, FLT 28

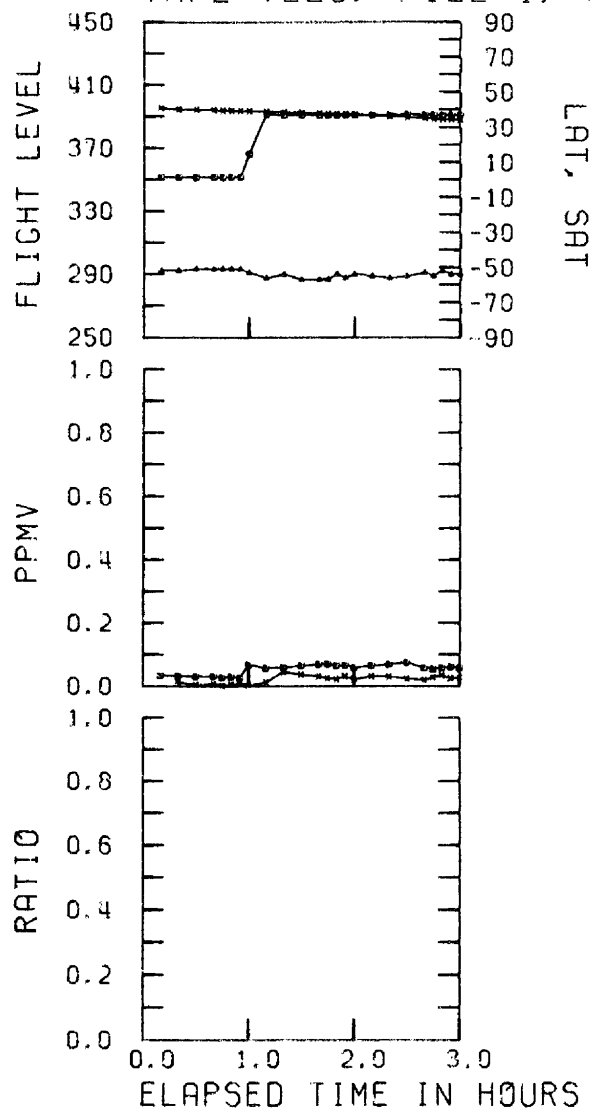


SEA TO ORD
DEPARTURE 13 FEB 79
TAPE VL29, FILE 1, FLT 29

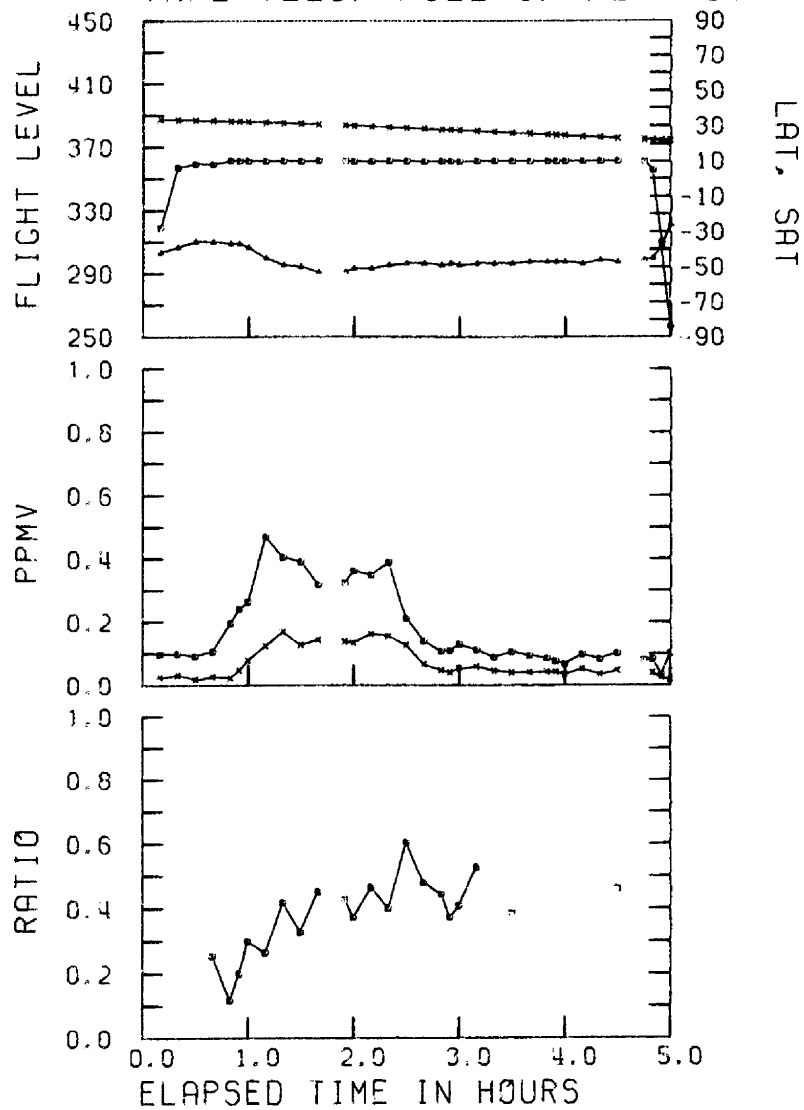


C-113

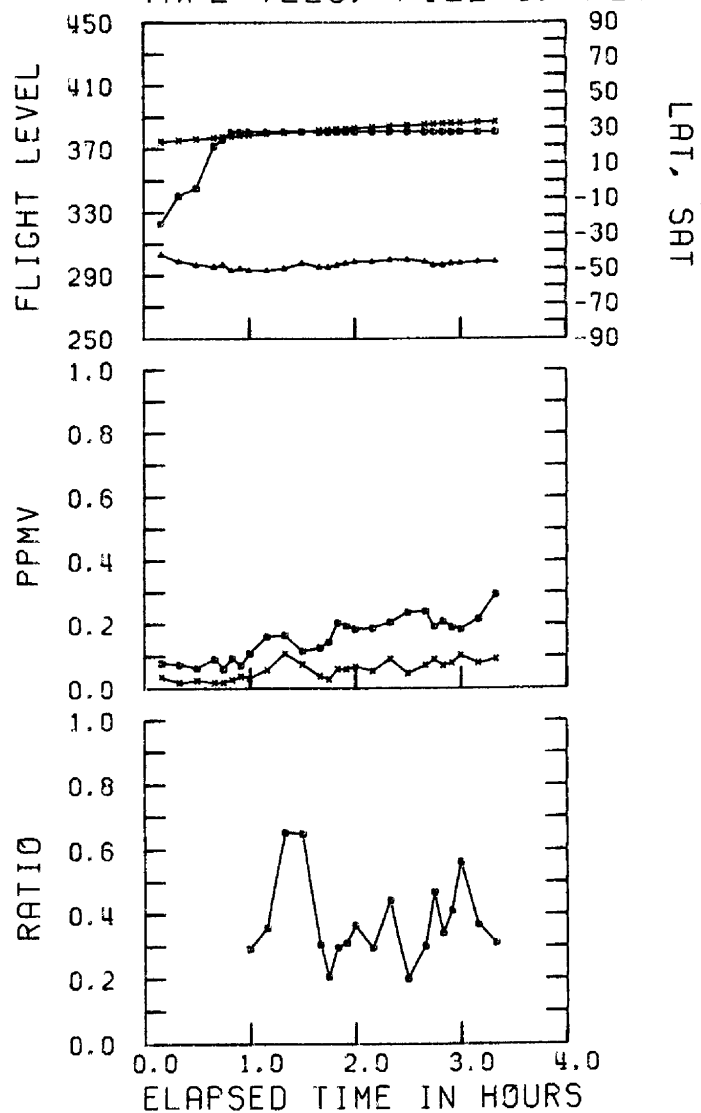
ORD TO LAX DEPARTURE 13 FEB 79
TAPE VL29, FILE 1, FLT 30



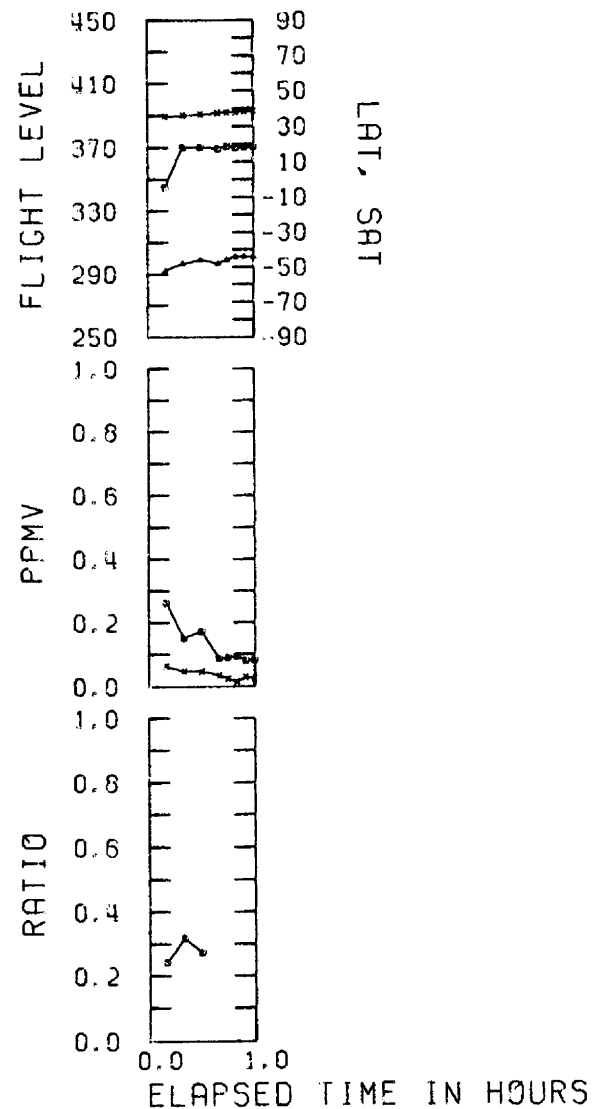
LAX TO HNL DEPARTURE 14 FEB 79
TAPE VL29, FILE 1, FLT 31



HNL TO LAX DEPARTURE 14 FEB 79
TAPE VL29, FILE 1, FLT 32



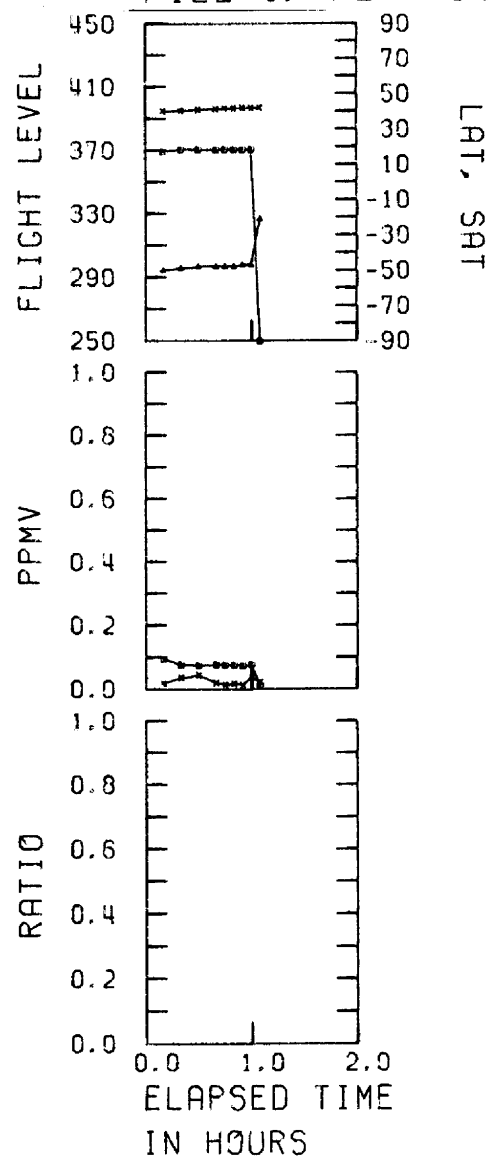
LAX TO DEN
DEPARTURE 15 FEB 79
TAPE VL29,
FILE 1, FLT 33



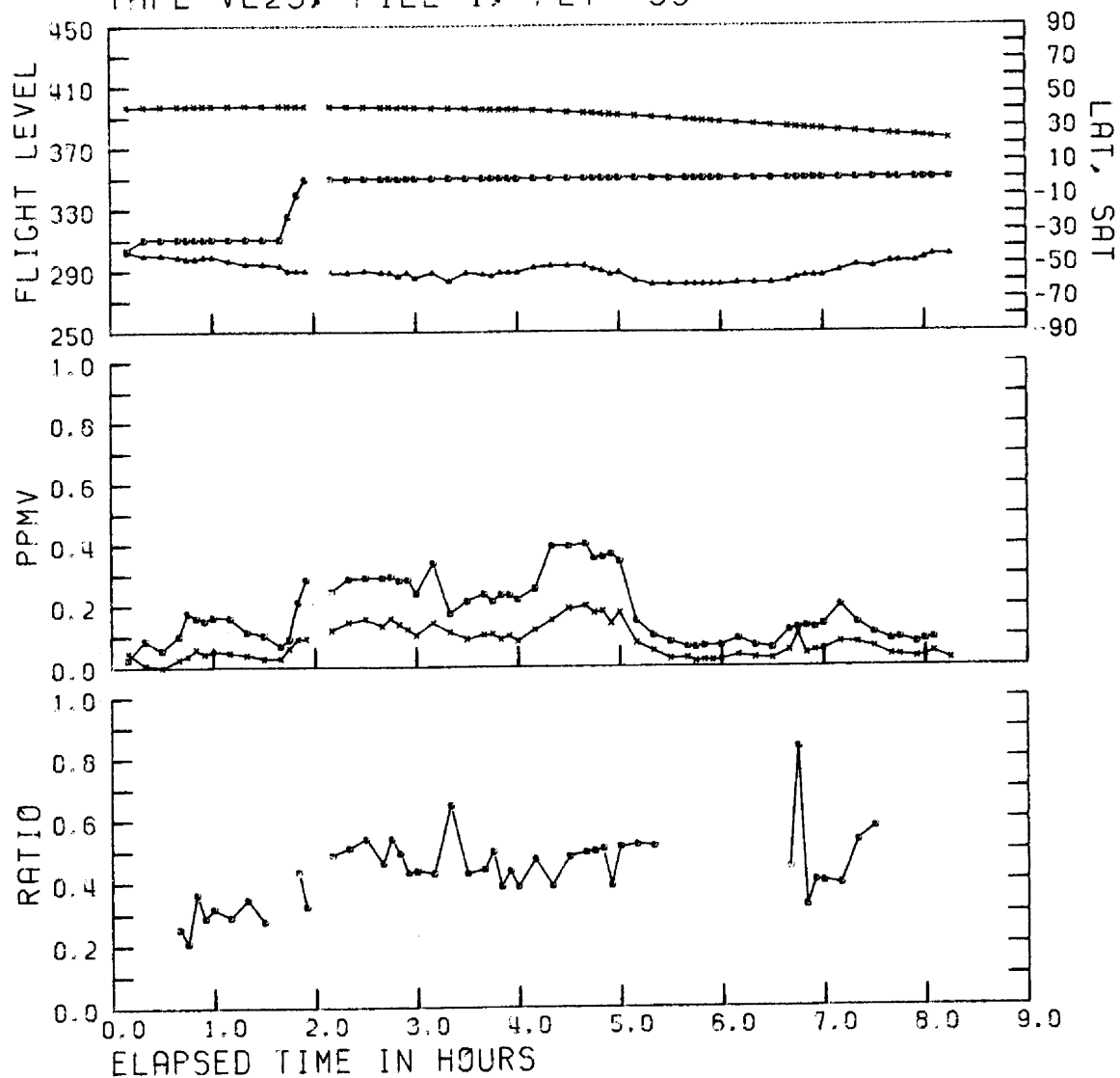
C-114

DEN TO ORD
 DEPARTURE 15 FEB 79
 TAPE VL29,
 FILE 1, FLT 34

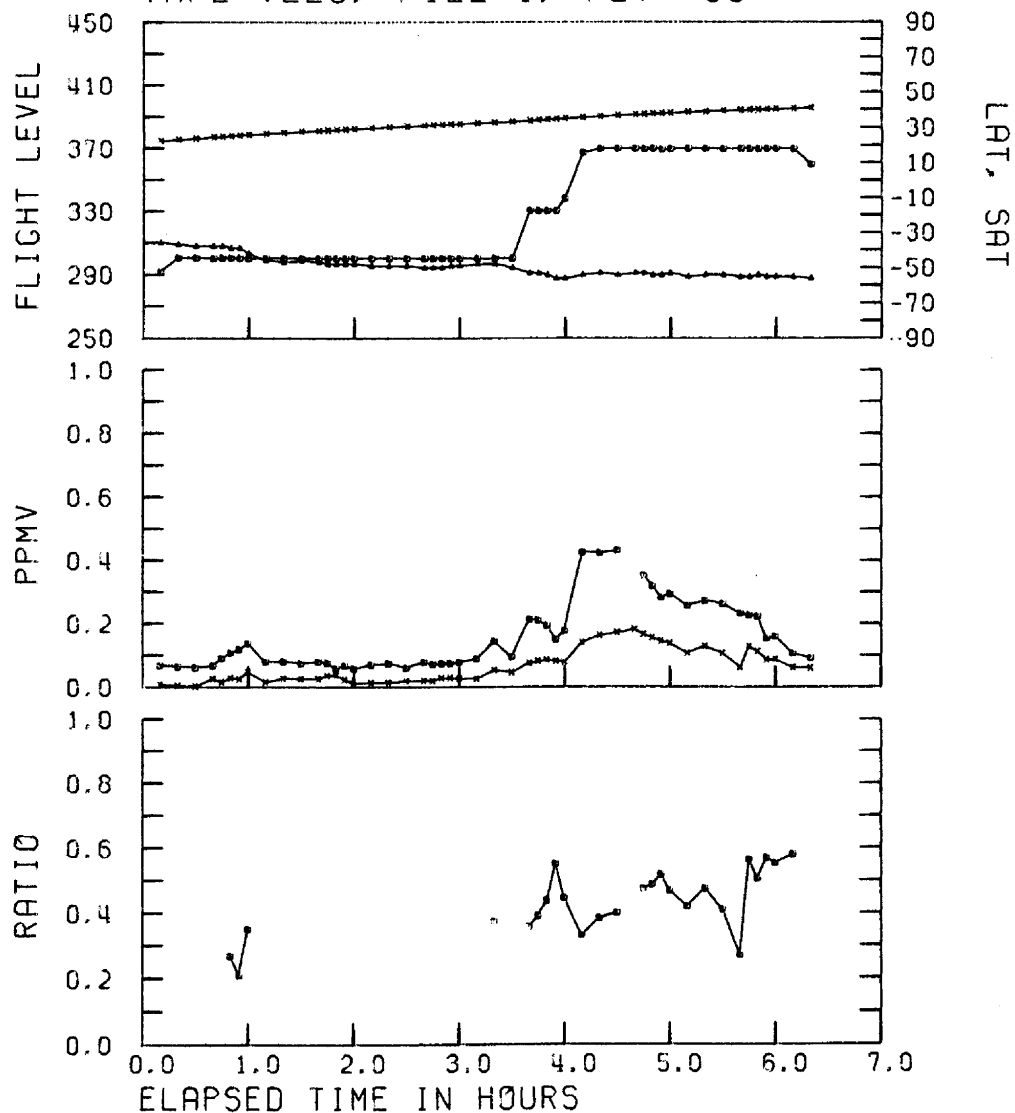
C-115



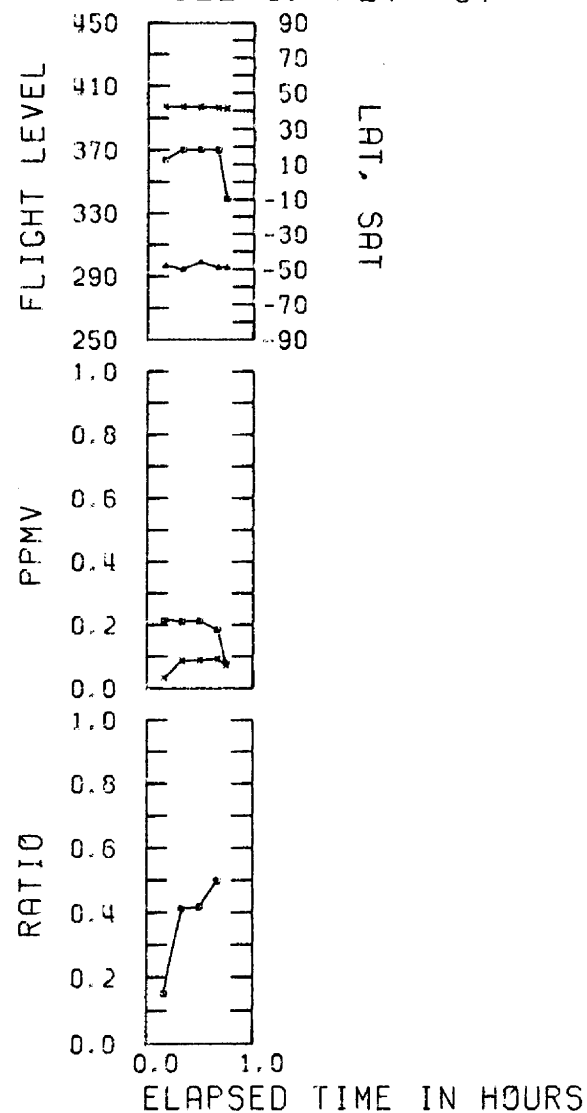
ORD TO HNL DEPARTURE 15 FEB 79
 TAPE VL29, FILE 1, FLT 35



HNL TO ORD DEPARTURE 16 FEB 79
TAPE VL29, FILE 1, FLT 36

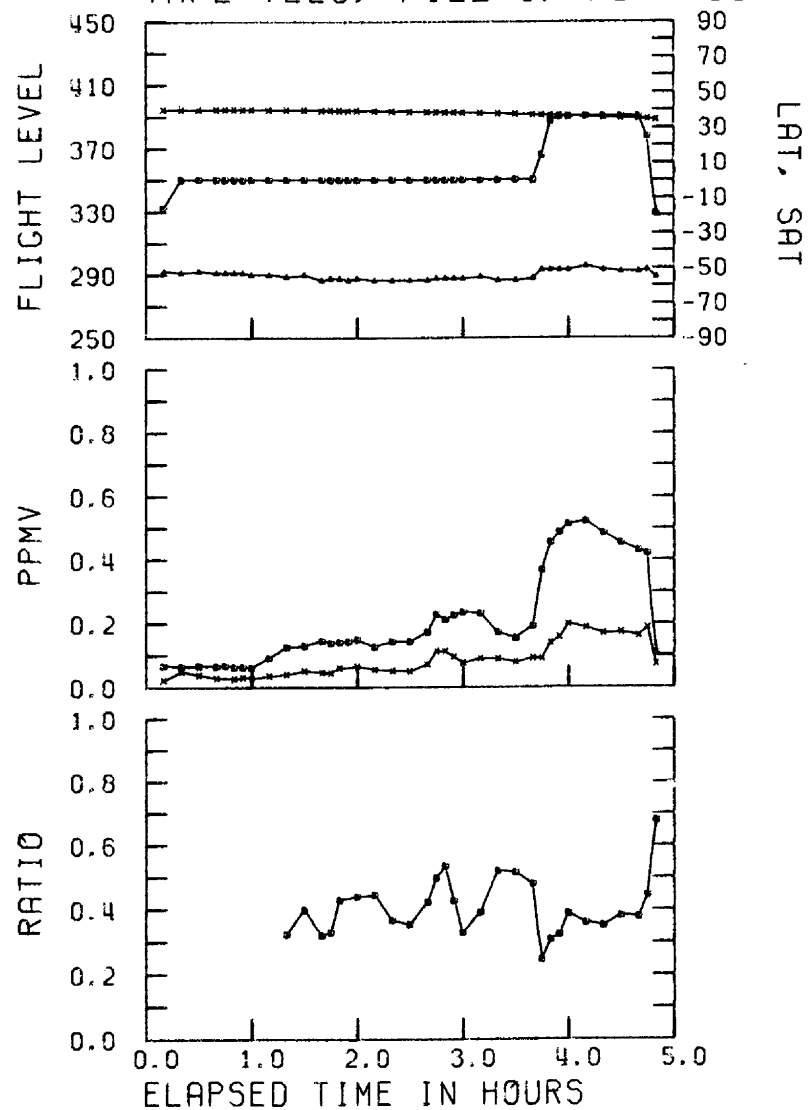


ORD TO JFK
DEPARTURE 16 FEB 79
TAPE VL29,
FILE 1, FLT 37

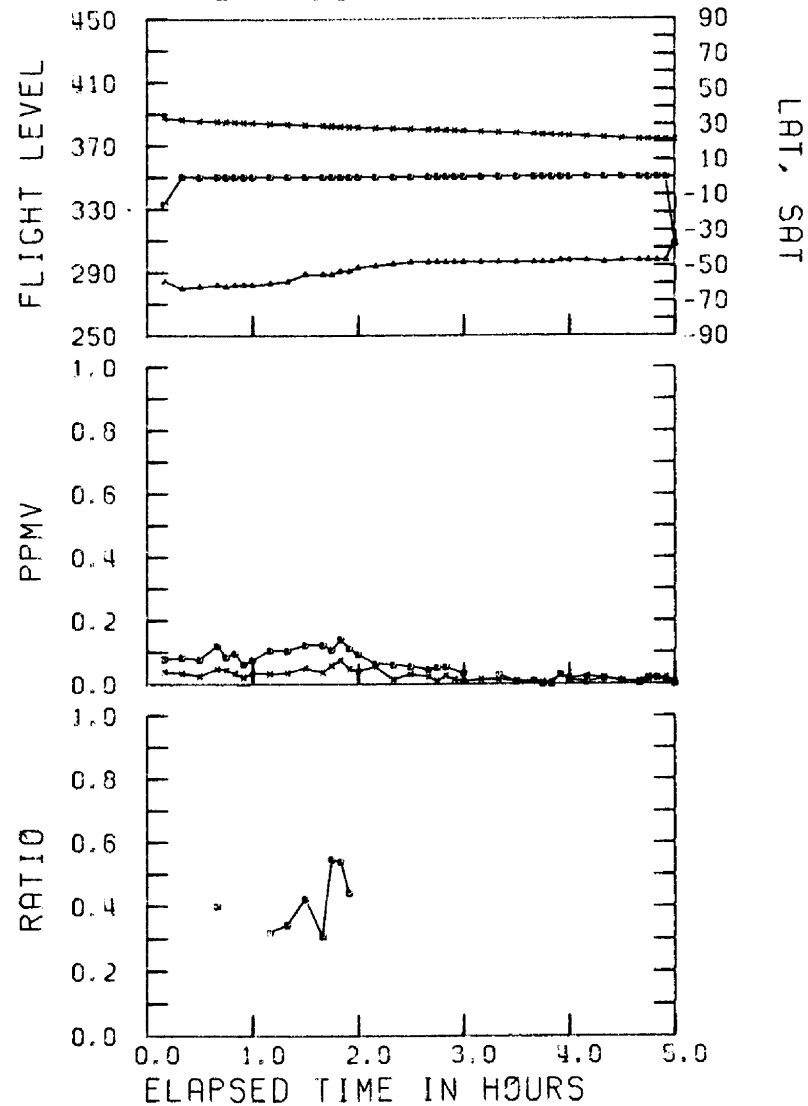


JFK TO LAX DEPARTURE 16 FEB 79
TAPE VL29, FILE 1, FLT 38

C-117

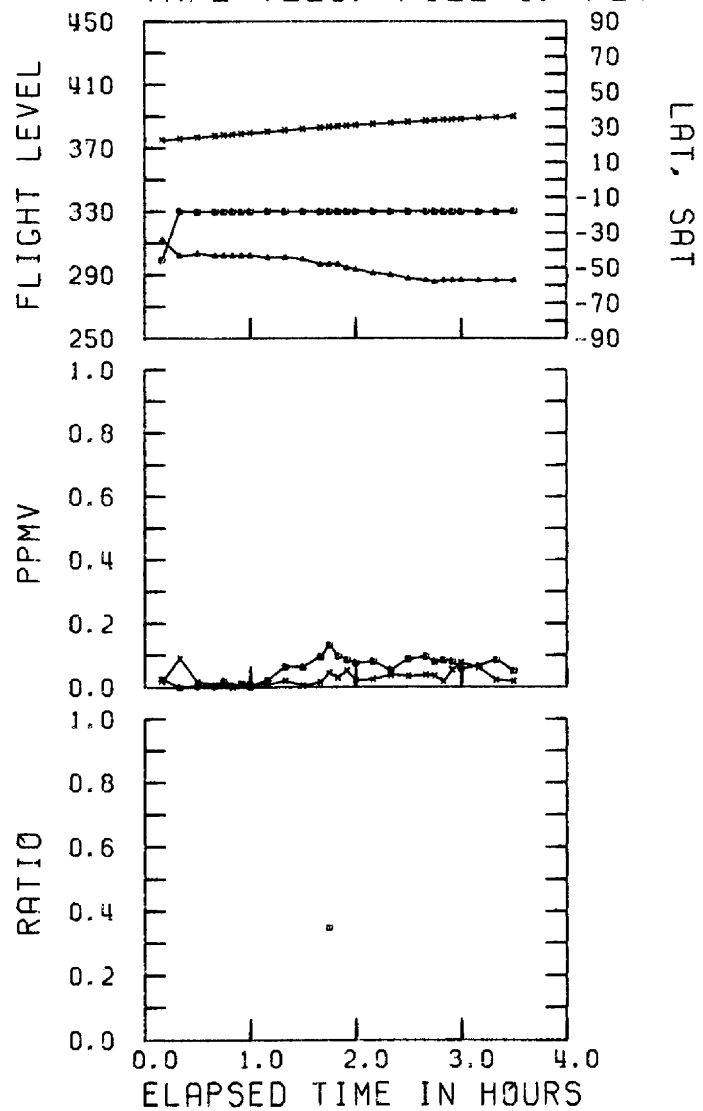


LAX TO HNL DEPARTURE 17 FEB 79
TAPE VL29, FILE 1, FLT 39

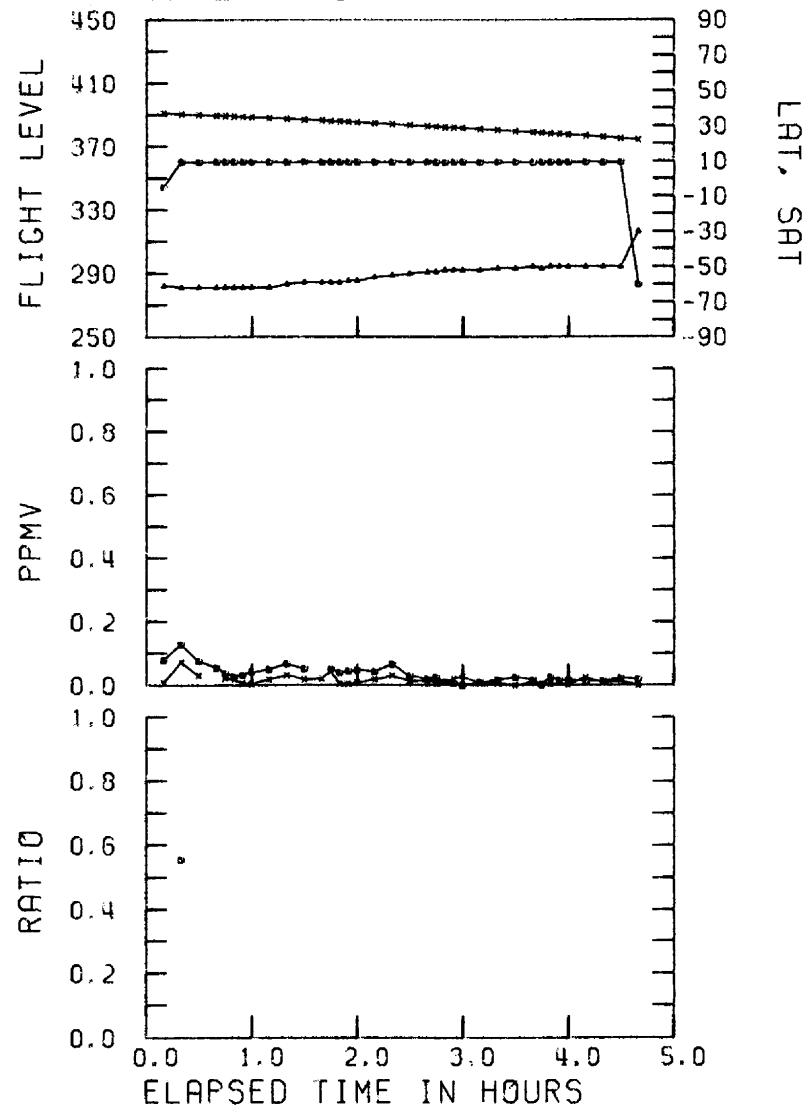


C-118

HNL TO SFO DEPARTURE 17 FEB 79
TAPE VL29, FILE 1, FLT 40

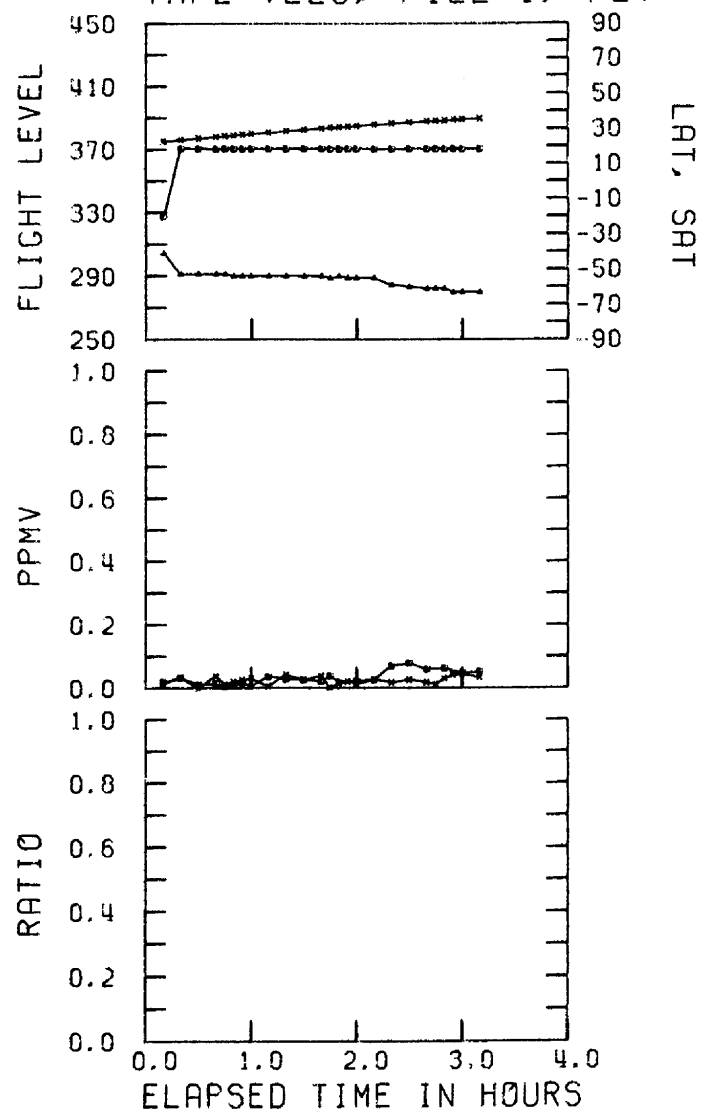


SFO TO HNL DEPARTURE 18 FEB 79
TAPE VL29, FILE 1, FLT 41

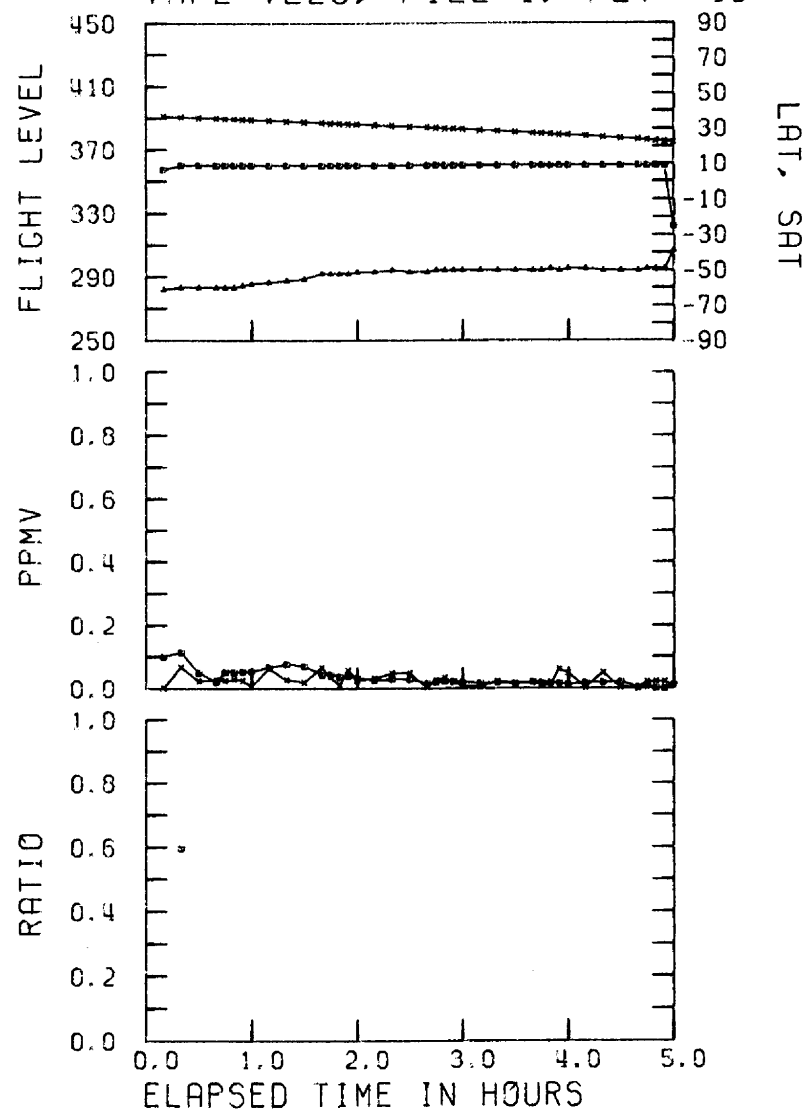


611-3

HNL TO SFO DEPARTURE 18 FEB 79
TAPE VL29, FILE 1, FLT 42

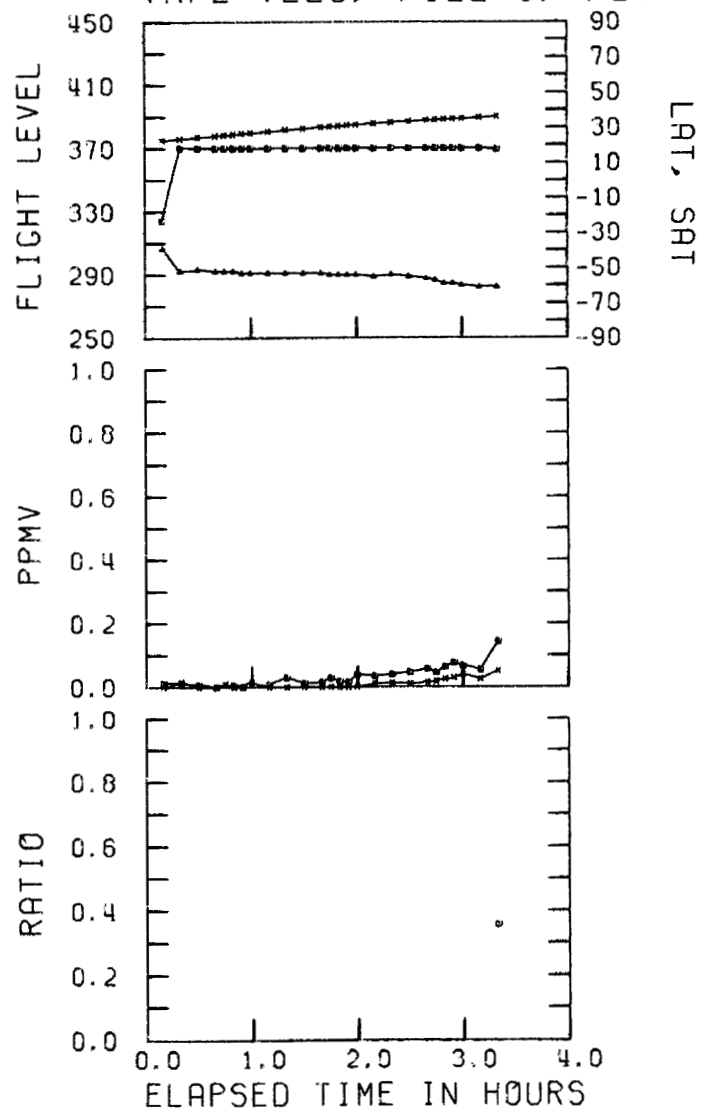


SFO TO HNL DEPARTURE 19 FEB 79
TAPE VL29, FILE 1, FLT 43

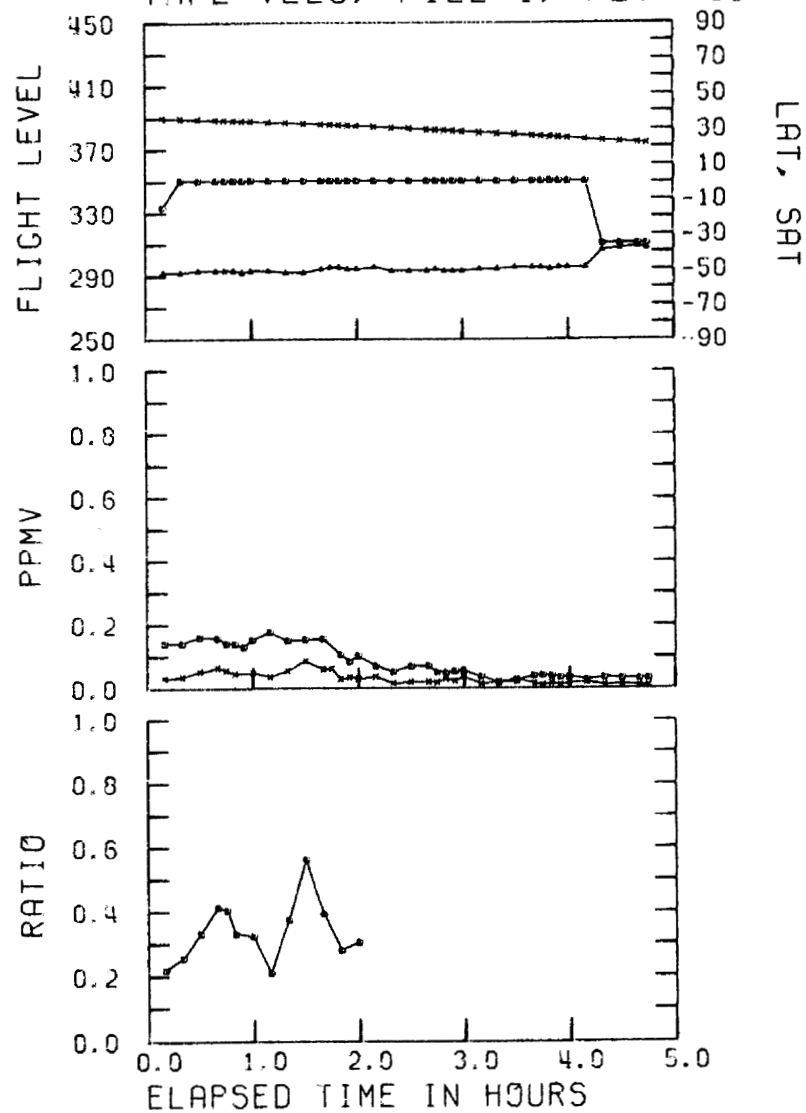


C-120

HNL TO SFO DEPARTURE 19 FEB 79
TAPE VL29, FILE 1, FLT 44

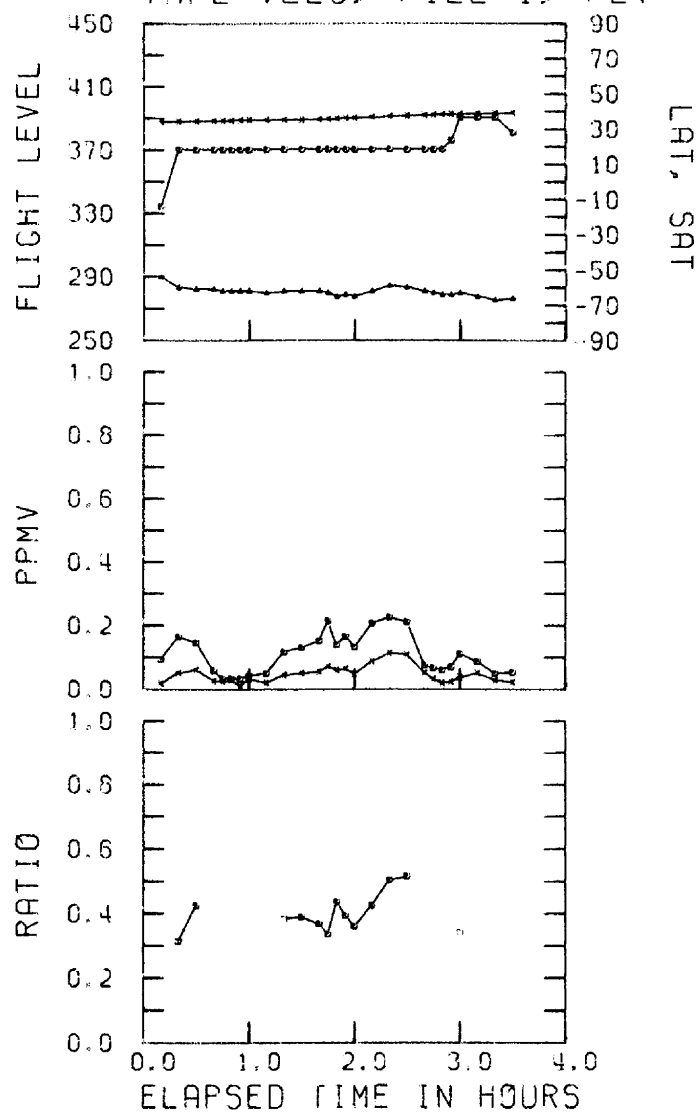


SFO TO HNL DEPARTURE 20 FEB 79
TAPE VL29, FILE 1, FLT 45

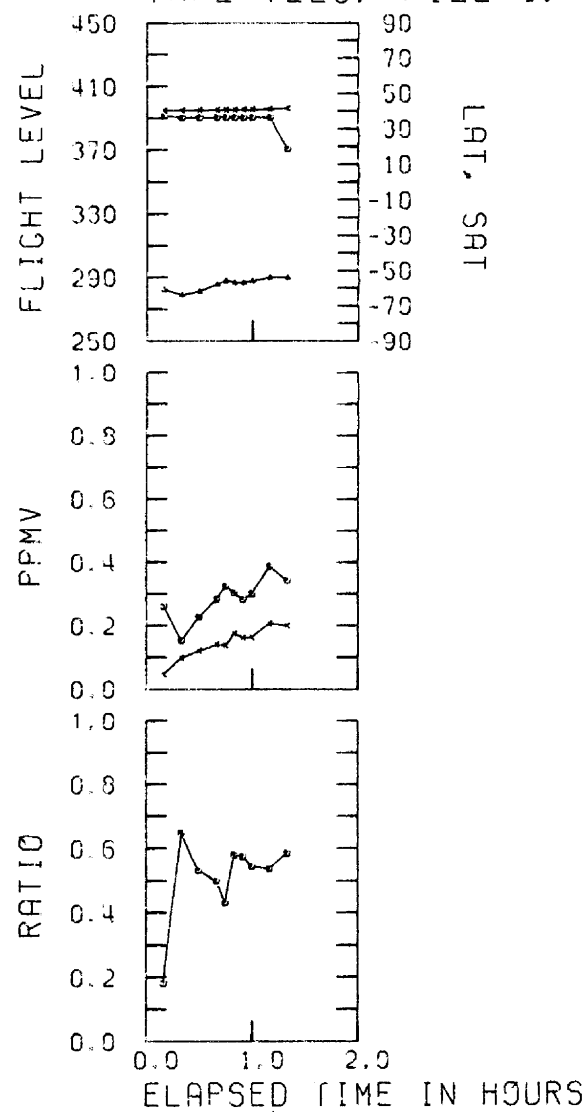


C-121

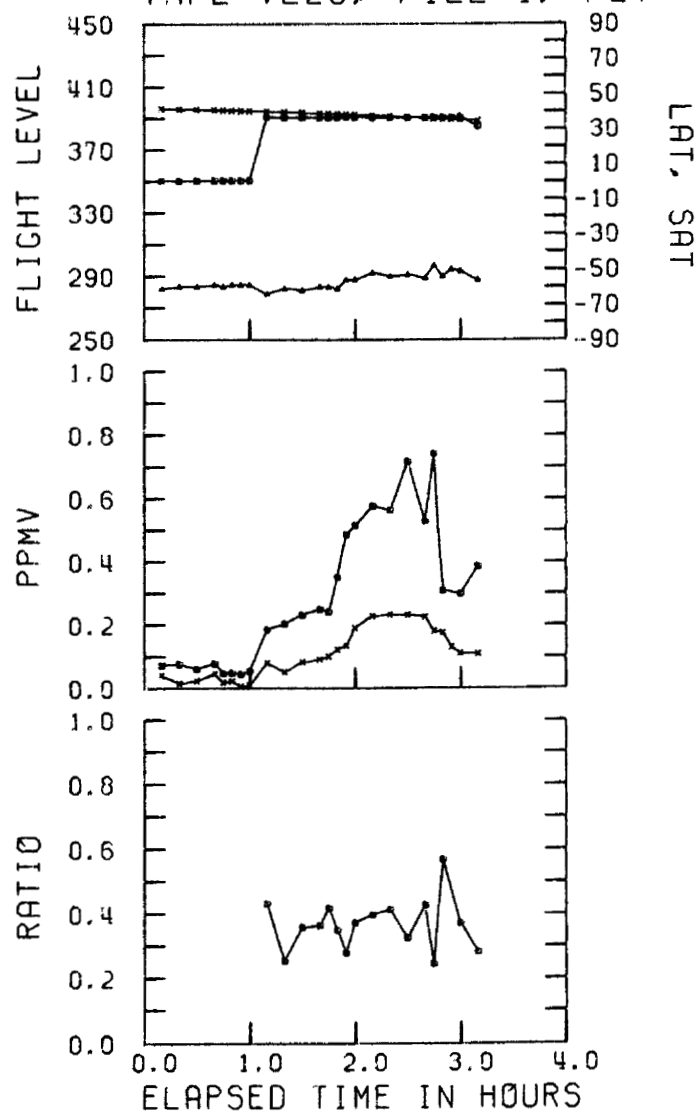
LAX TO JFK DEPARTURE 21 FEB 79
TAPE VL29, FILE 1, FLT 46



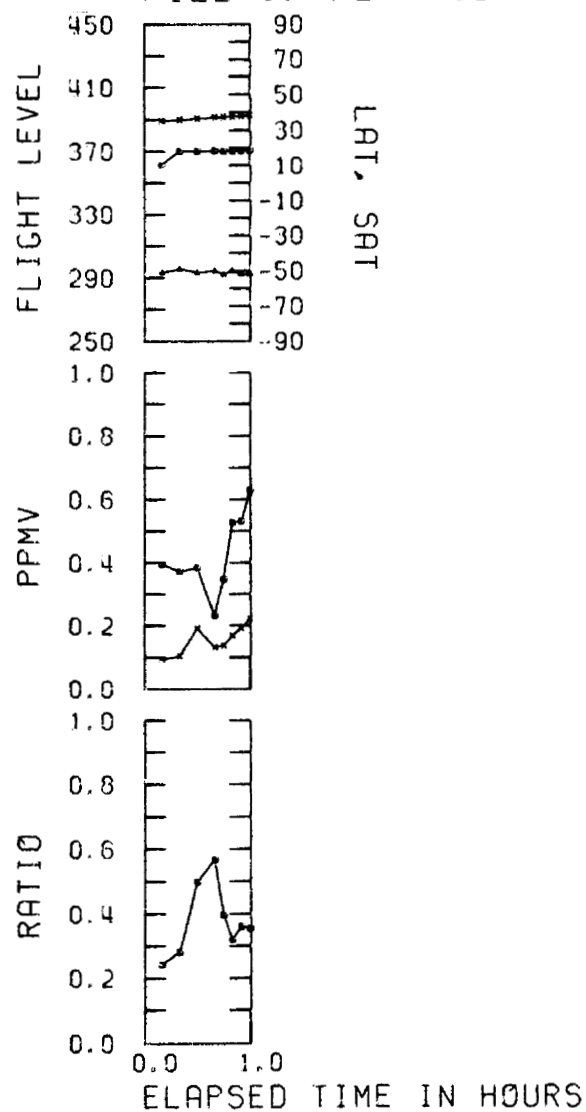
JFK TO ORD
DEPARTURE 21 FEB 79
TAPE VL29, FILE 1, FLT 47



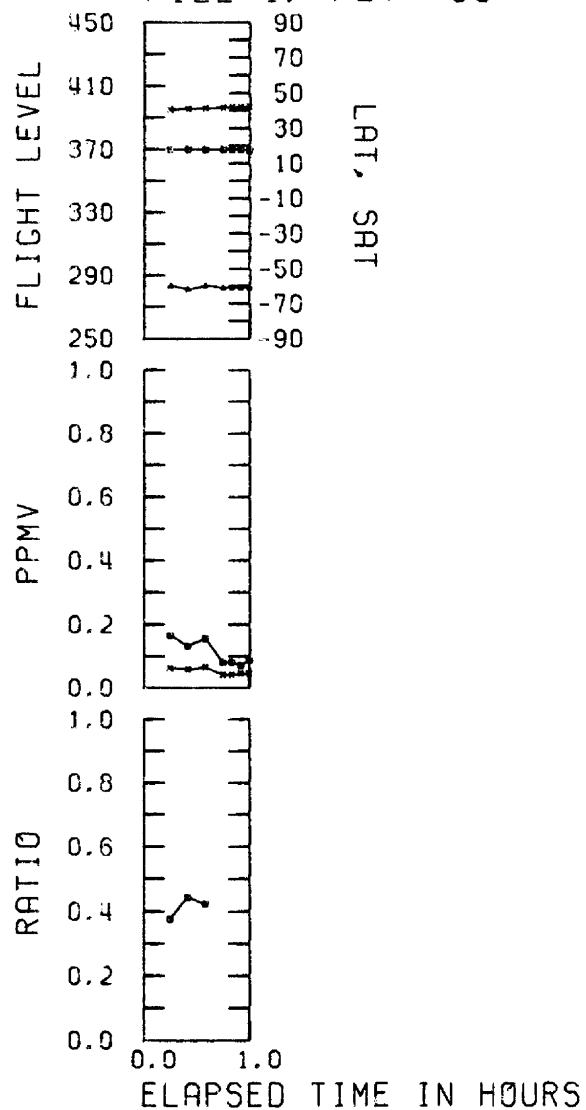
ORD TO LAX DEPARTURE 21 FEB 79
TAPE VL29, FILE 1, FLT 48



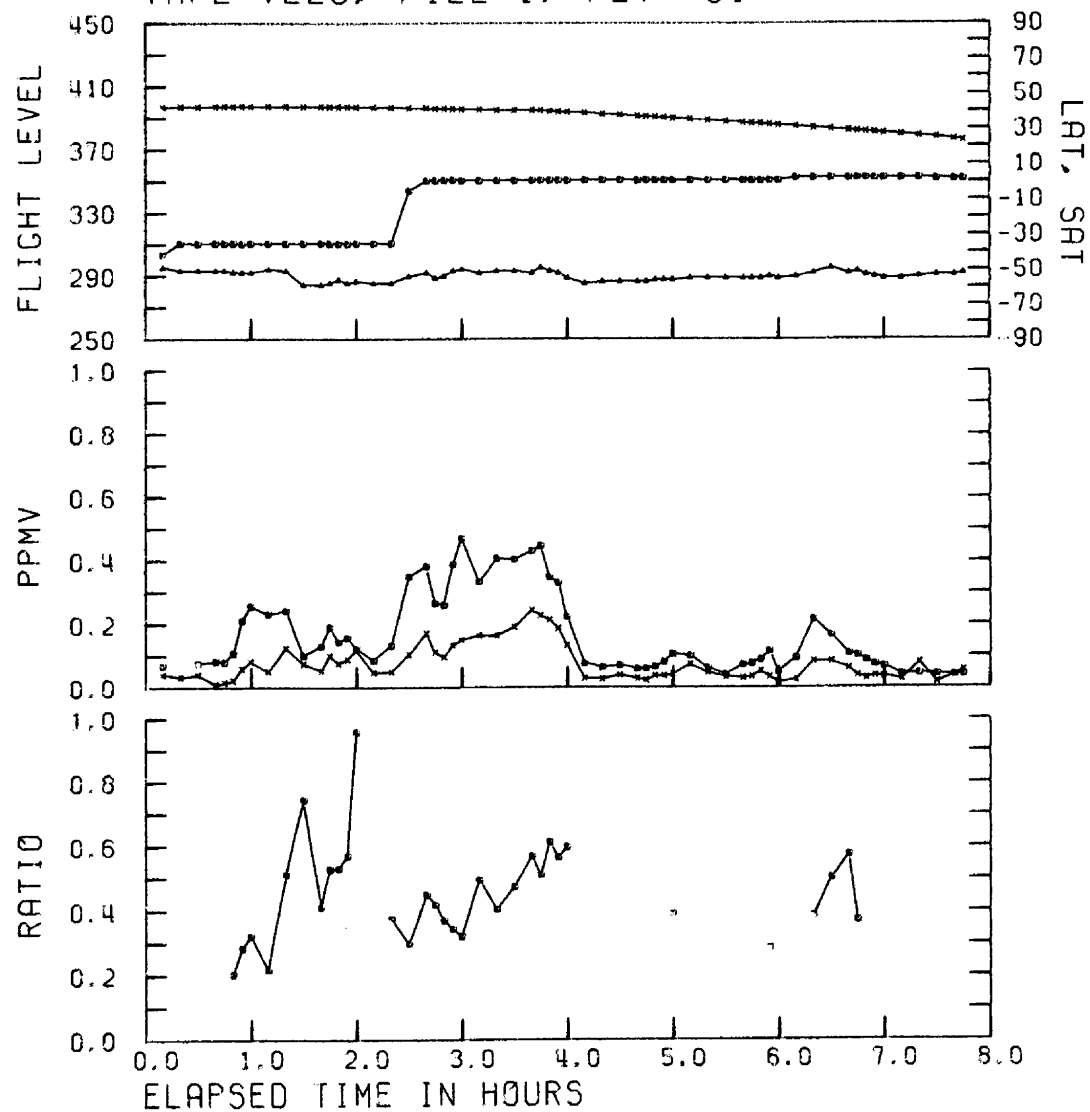
LAX TO DEN
DEPARTURE 22 FEB 79
TAPE VL29,
FILE 1, FLT 49



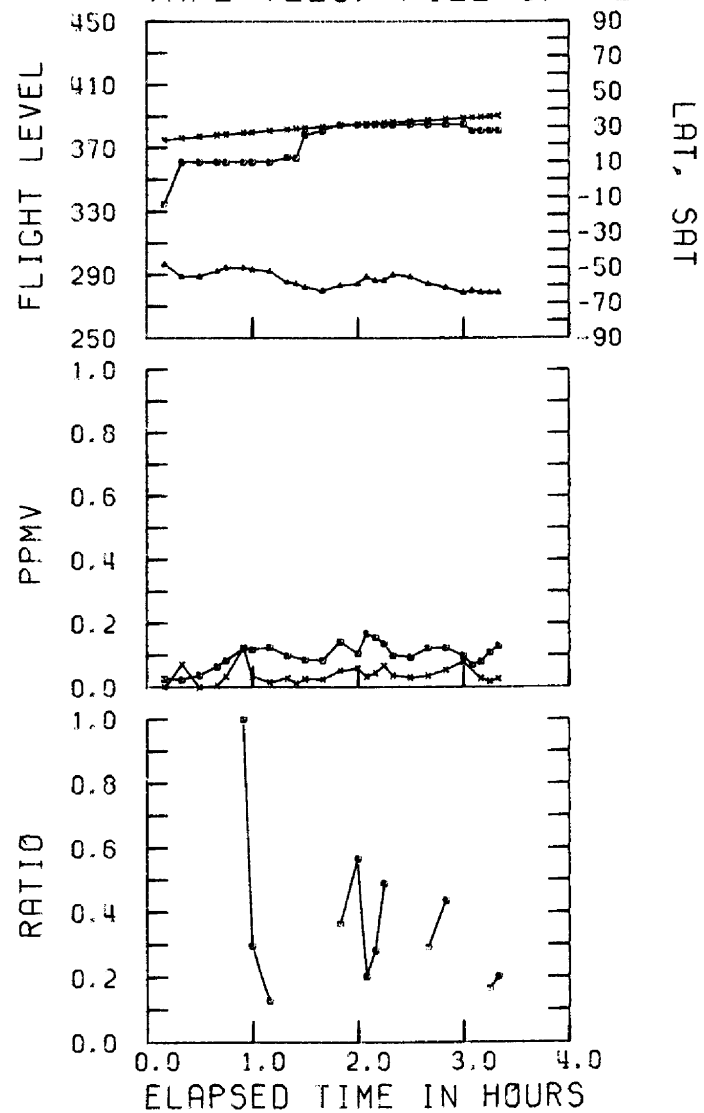
DEN TO ORD
DEPARTURE 22 FEB 79
TAPE VL29,
FILE 1, FLT 50



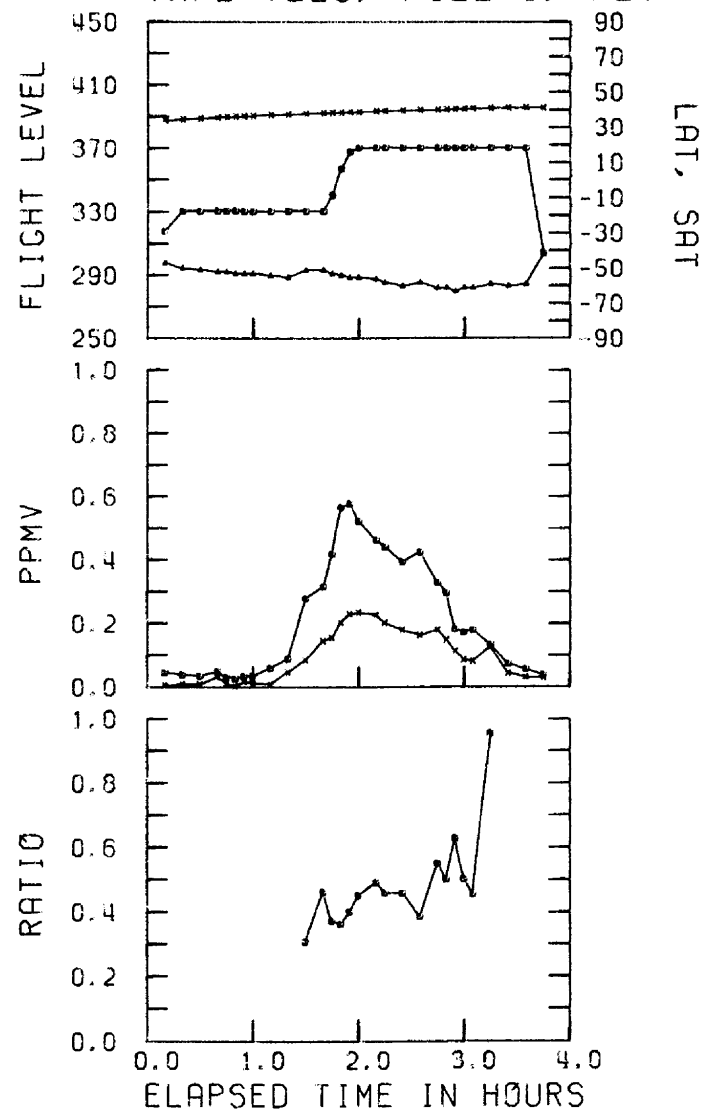
ORD TO HNL DEPARTURE 22 FEB 79
TAPE VL29, FILE 1, FLT 51



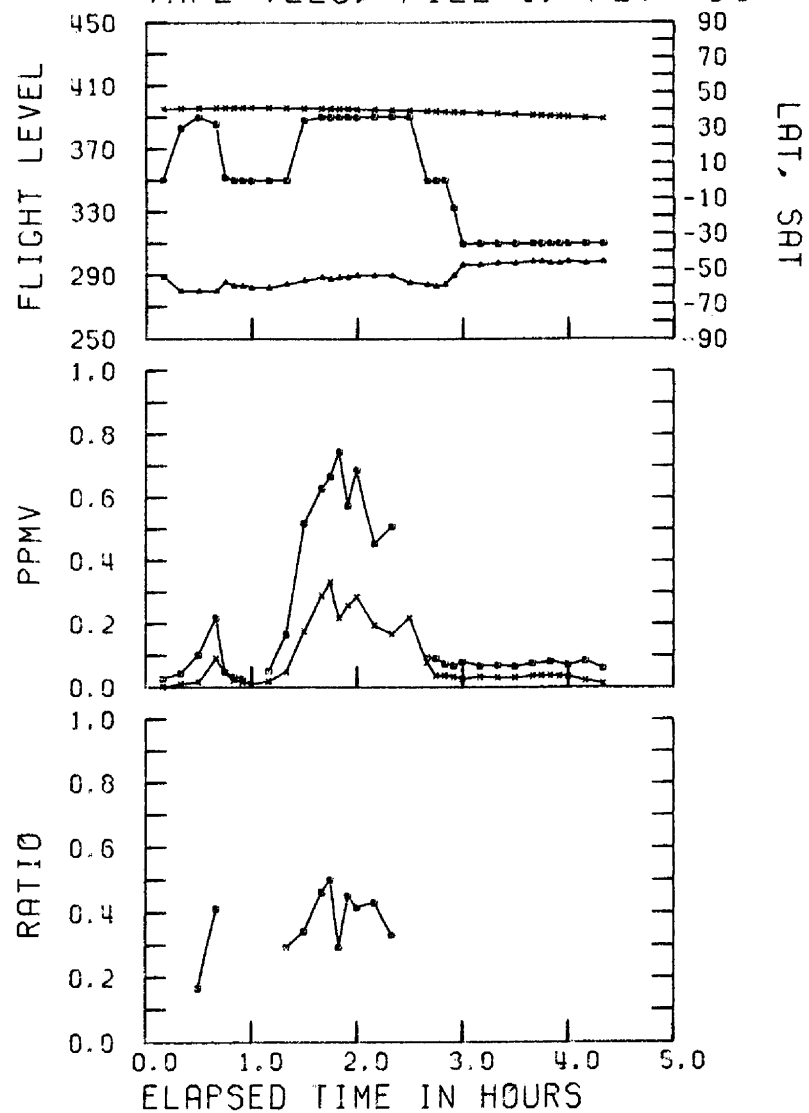
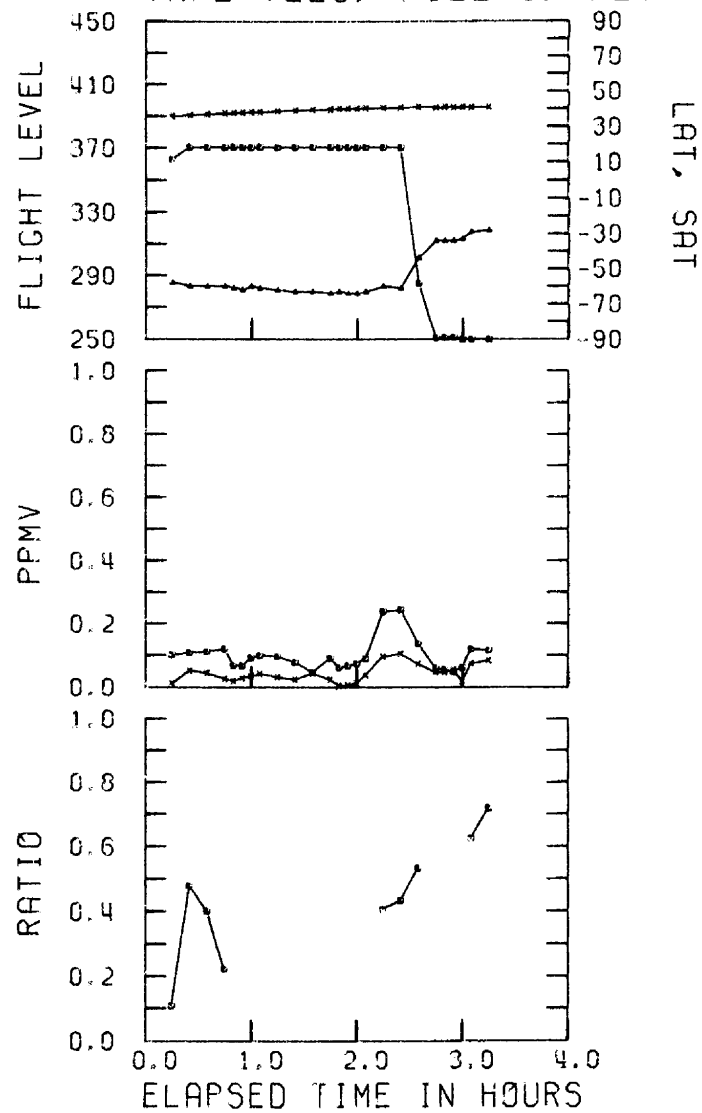
HNL TO SFO DEPARTURE 23 FEB 79
TAPE VL29, FILE 1, FLT 52



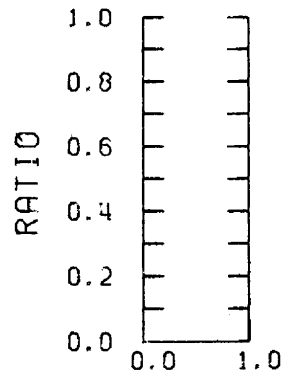
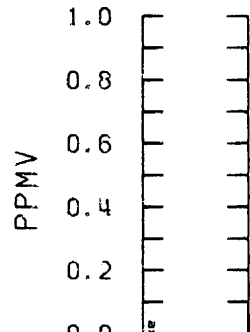
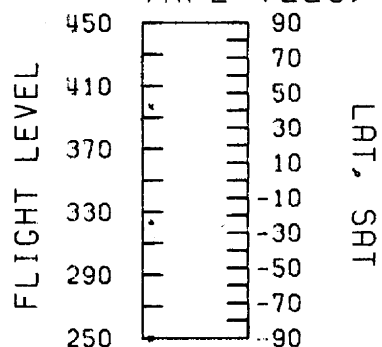
LAX TO JFK DEPARTURE 24 FEB 79
TAPE VL29, FILE 1, FLT 53



C-125

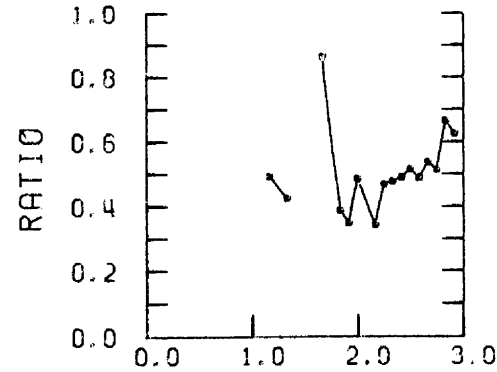
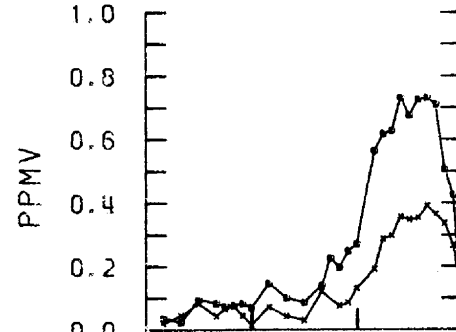
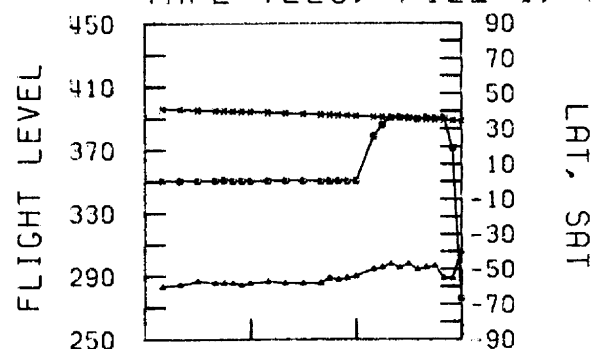
JFK TO LAX DEPARTURE 25 FEB 79
TAPE VL29, FILE 1, FLT 54LAX TO ORD DEPARTURE 25 FEB 79
TAPE VL29, FILE 1, FLT 55

ORD TO DTW
 DEPARTURE 26 FEB 79
 TAPE VL29, FILE 1, FLT 56



ELAPSED TIME IN HOURS

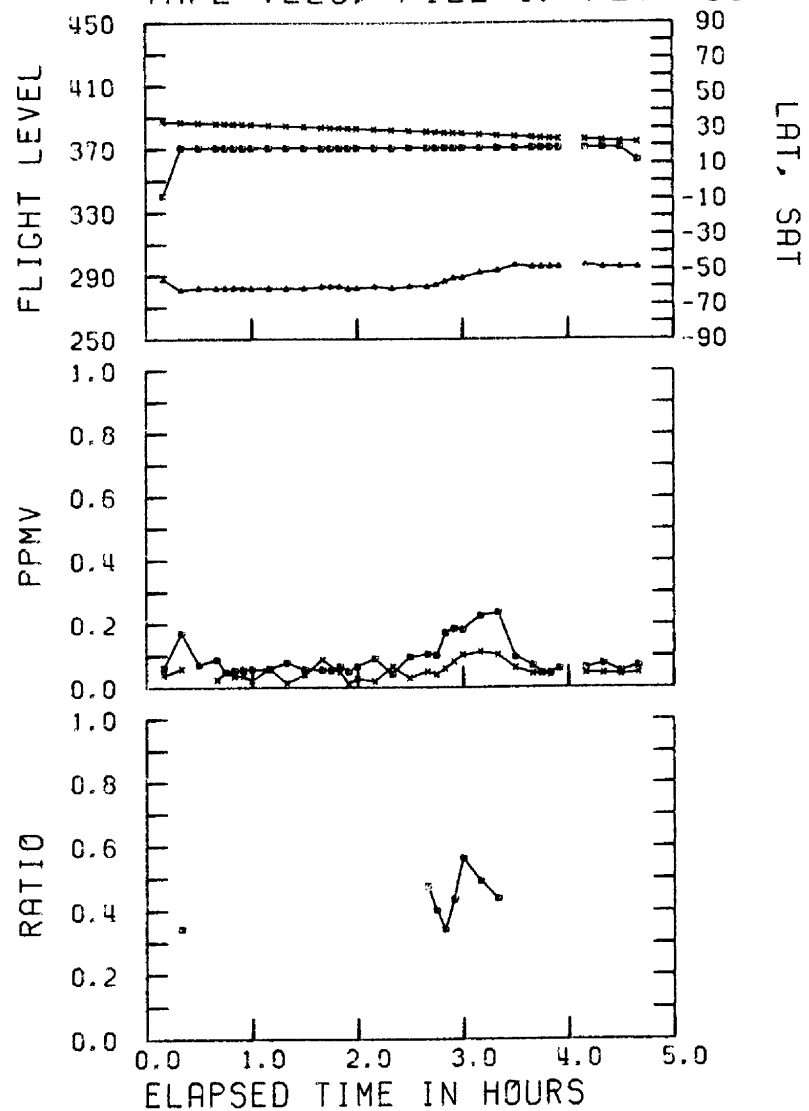
ORD TO LAX DEPARTURE 26 FEB 79
 TAPE VL29, FILE 1, FLT 60



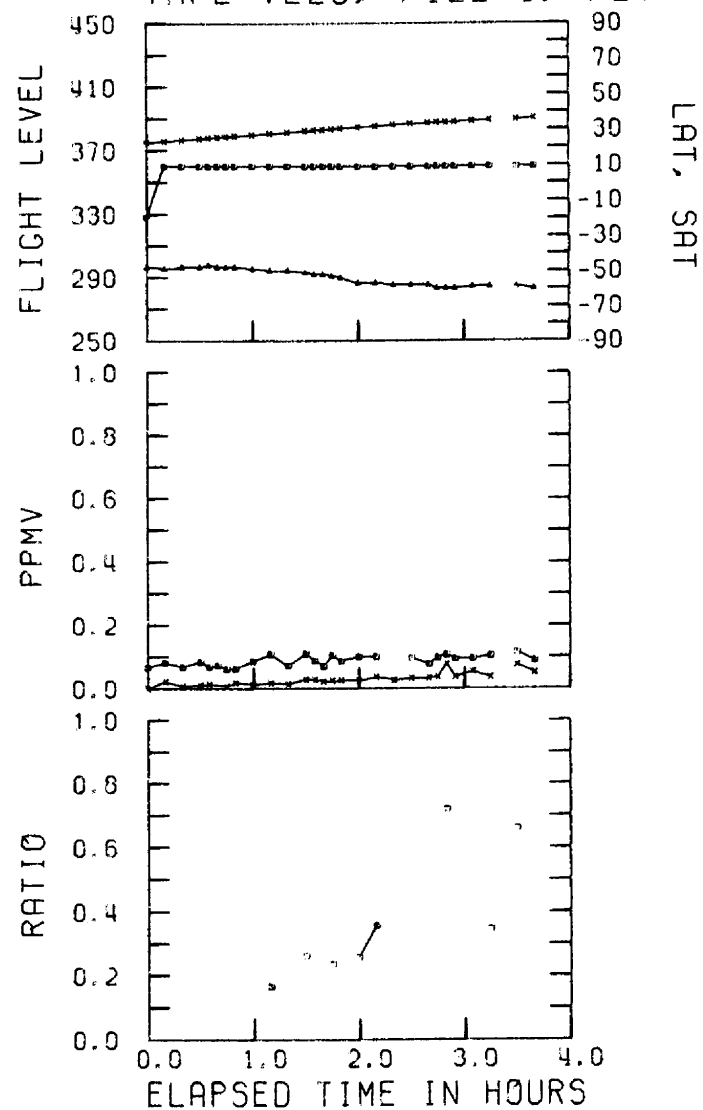
ELAPSED TIME IN HOURS

C-127

LAX TO HNL DEPARTURE 27 FEB 79
TAPE VL29, FILE 1, FLT 61

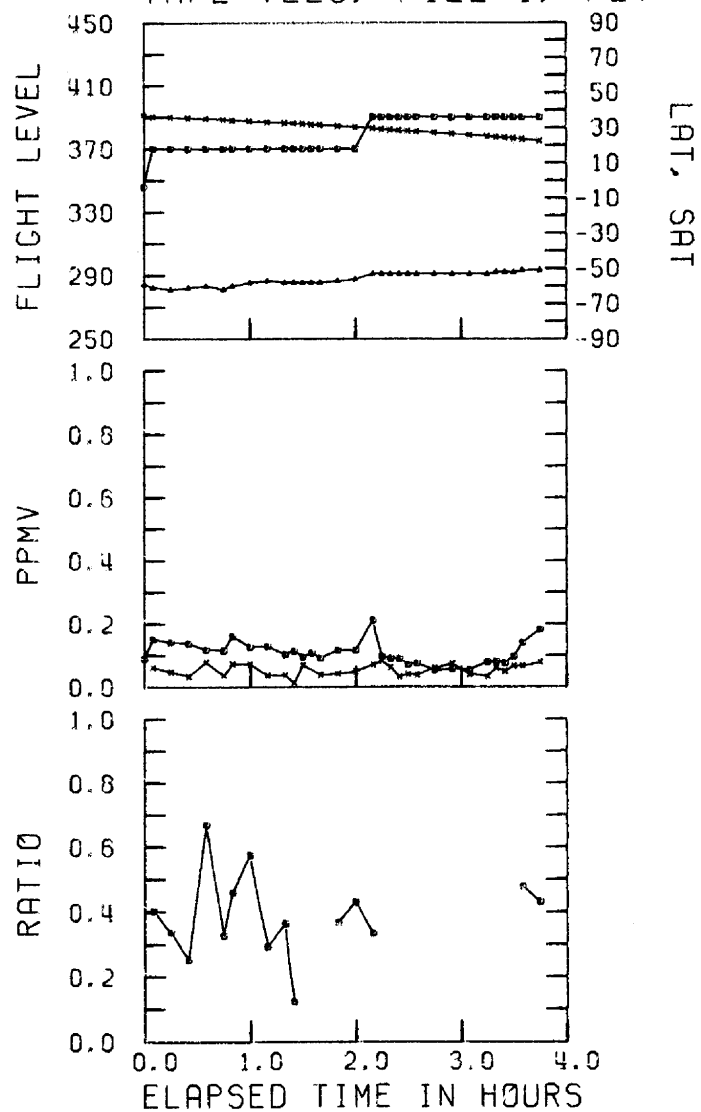


HNL TO SFO DEPARTURE 27 FEB 79
TAPE VL29, FILE 1, FLT 62

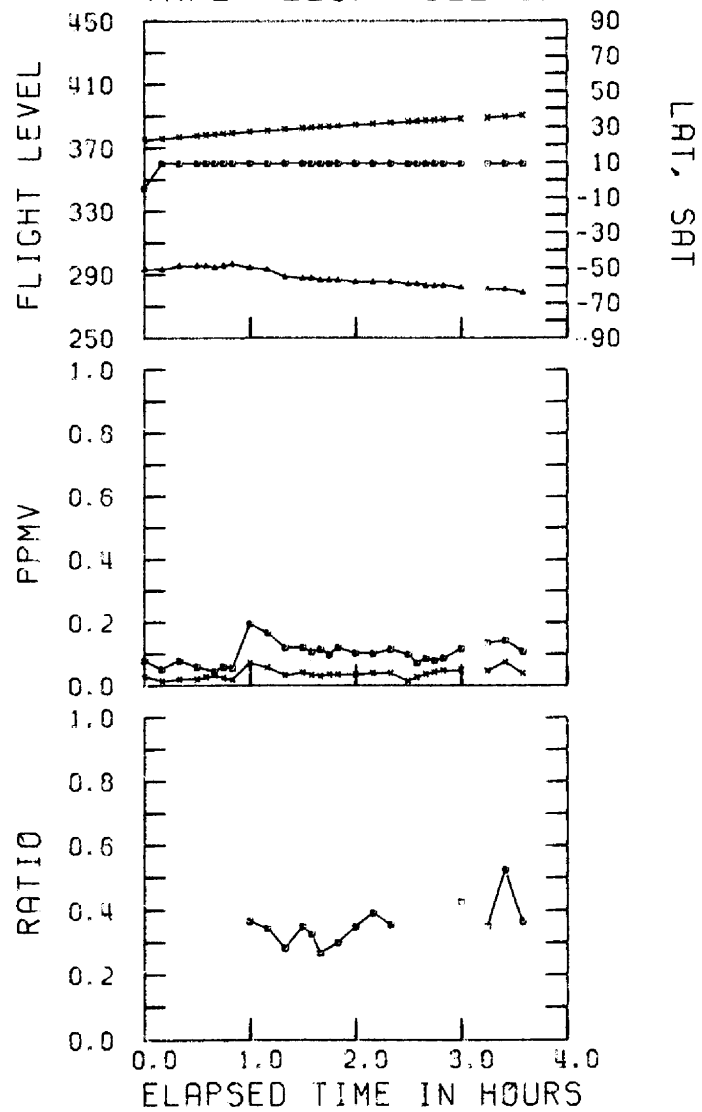


C-128

SFO TO HNL DEPARTURE 28 FEB 79
TAPE VL29, FILE 1, FLT 63

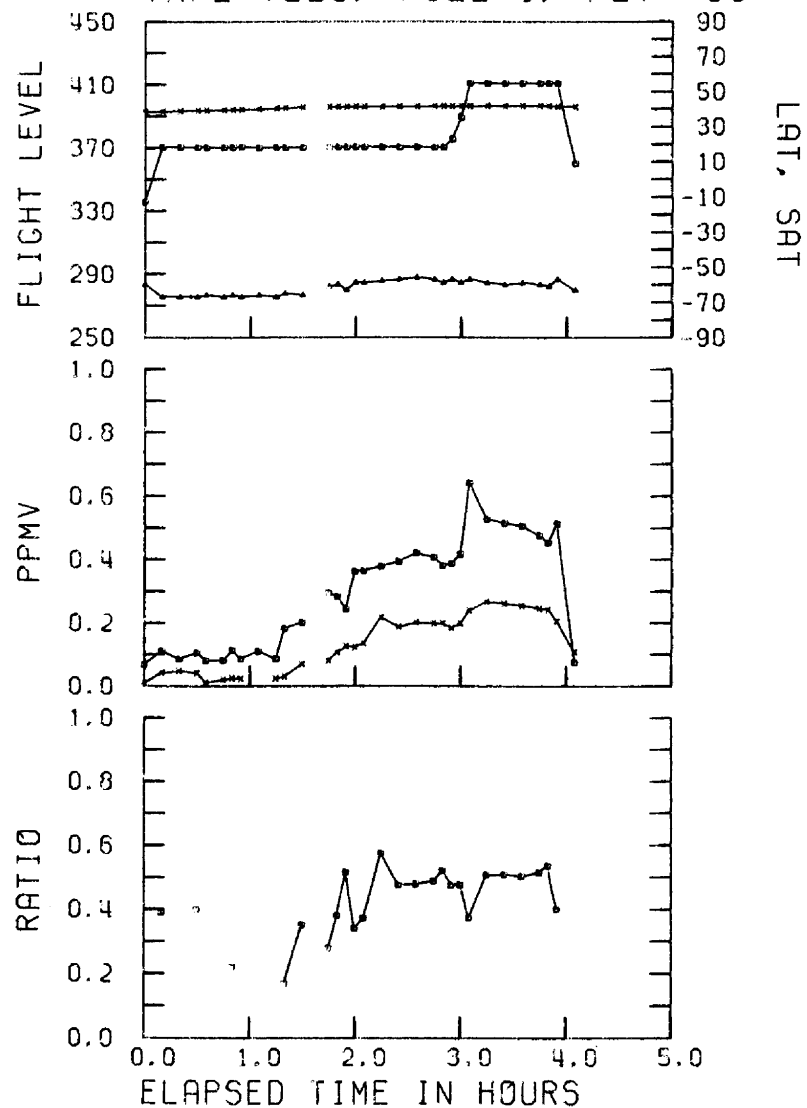


HNL TO SFO DEPARTURE 28 FEB 79
TAPE VL29, FILE 1, FLT 64

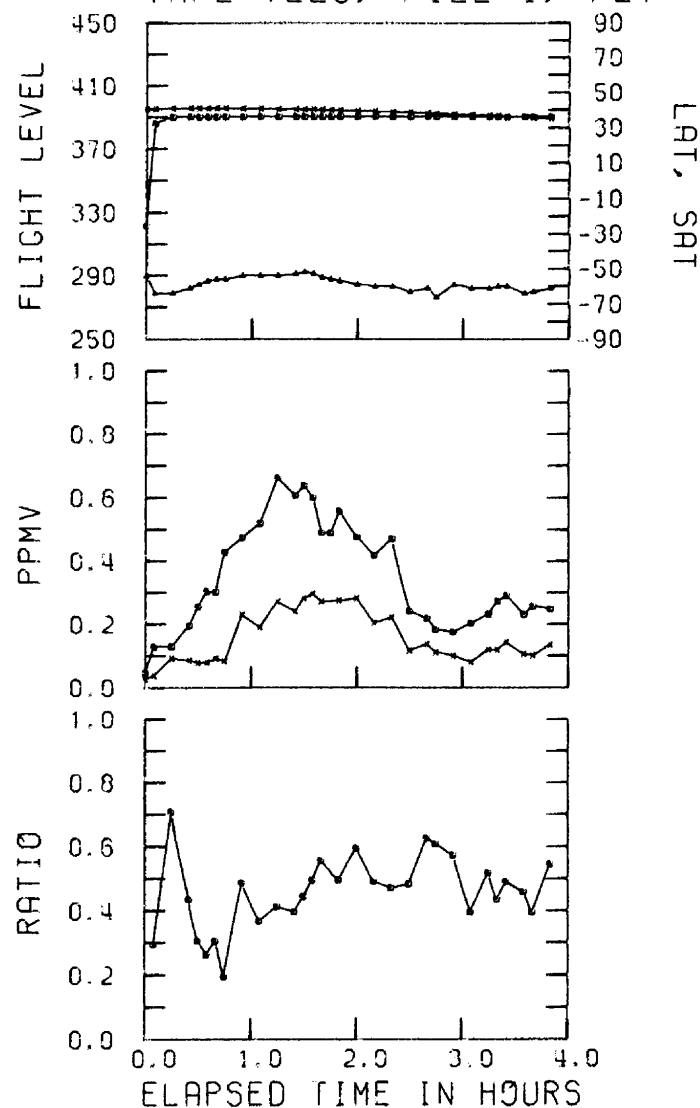


C-129

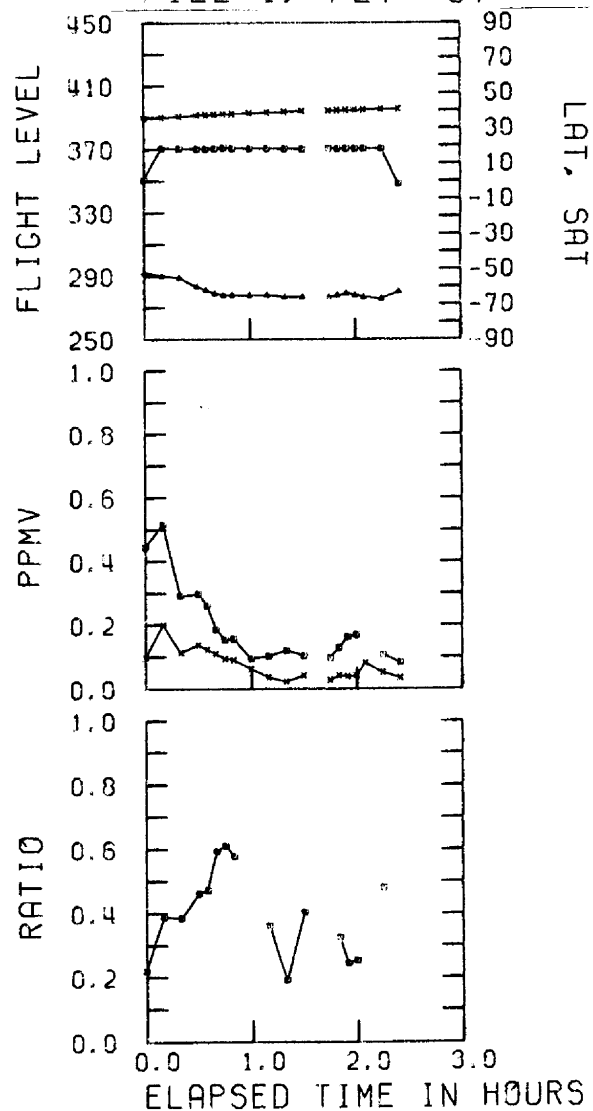
SFO TO JFK DEPARTURE 28 FEB 79
TAPE VL29, FILE 1, FLT 65



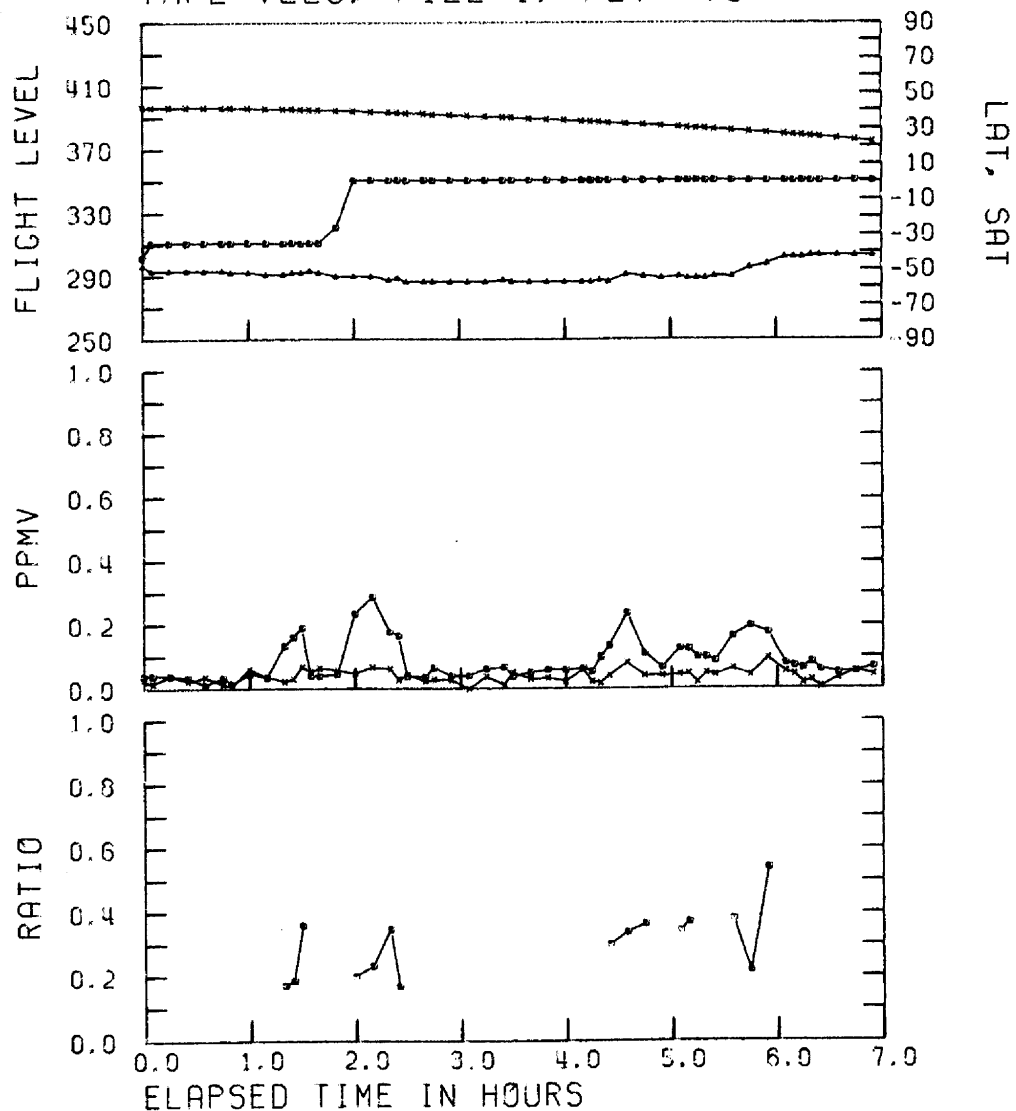
JFK TO LAX DEPARTURE 28 FEB 79
TAPE VL29, FILE 1, FLT 66



LAX TO ORD
 DEPARTURE 1 MAR 79
 TAPE VL29,
 FILE 1, FLT 67

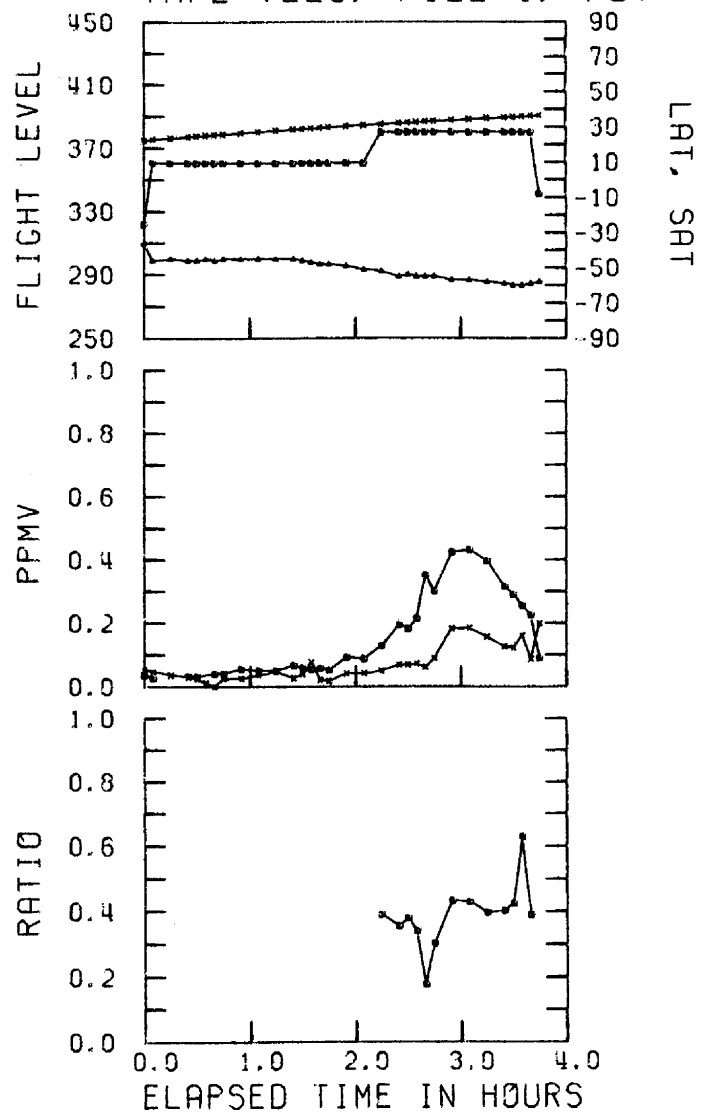


ORD TO HNL DEPARTURE 2 MAR 79
 TAPE VL29, FILE 1, FLT 70

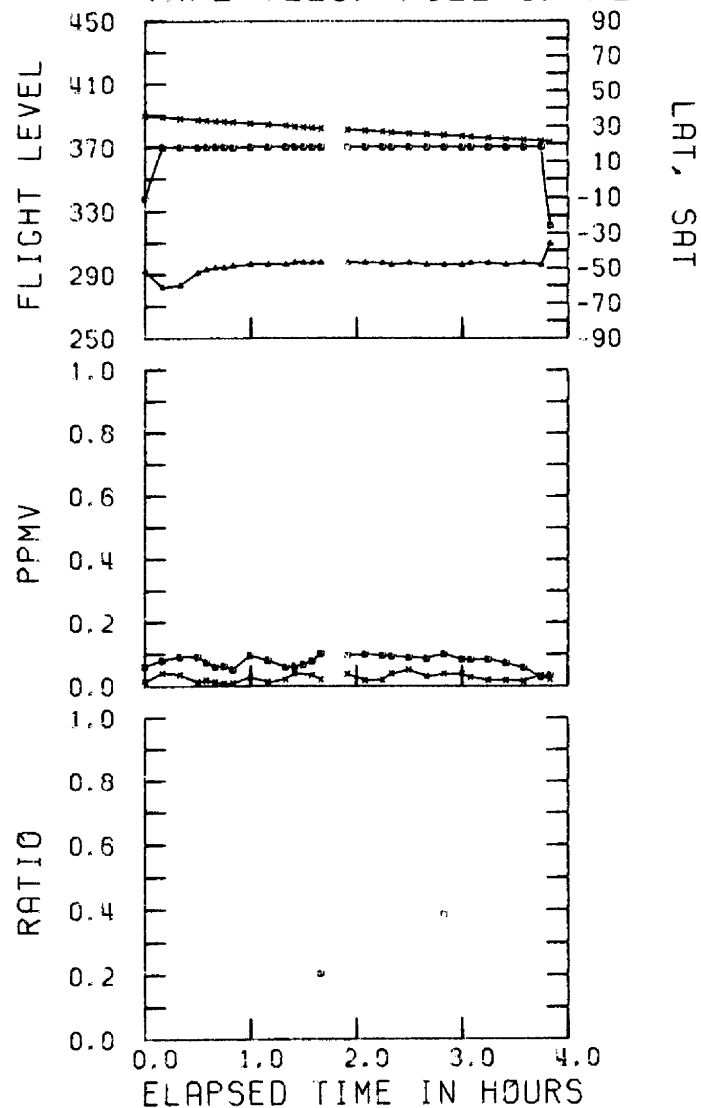


HNL TO SFO DEPARTURE 3 MAR 79
TAPE VL29, FILE 1, FLT 71

C-131

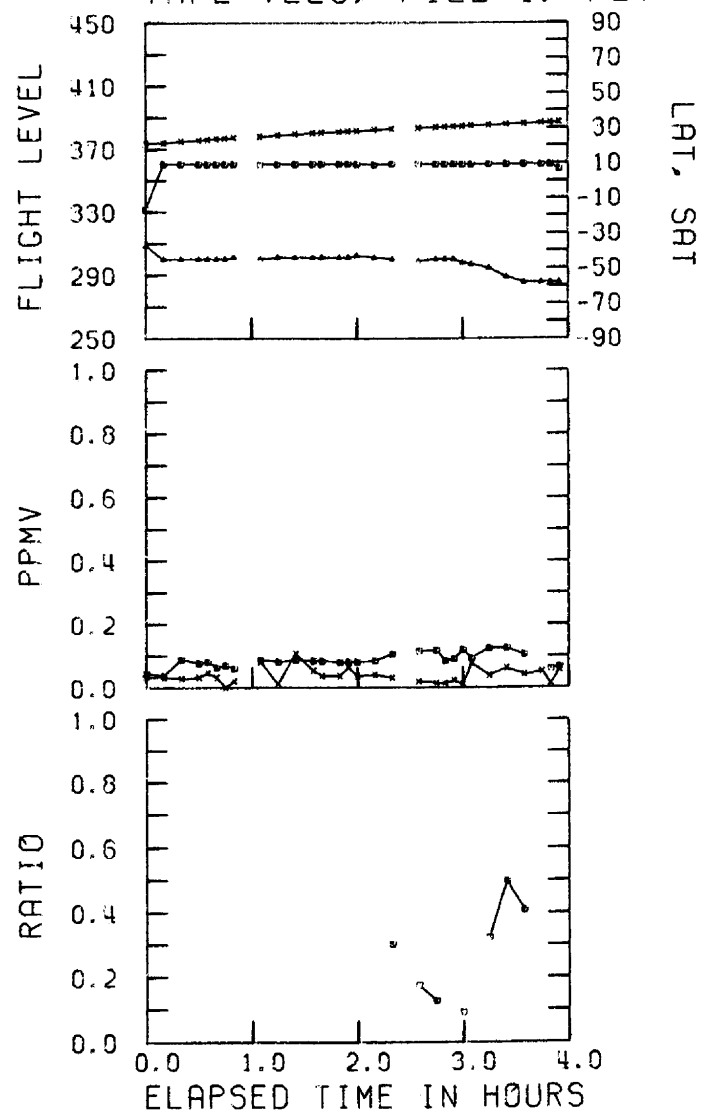


SFO TO HNL DEPARTURE 5 MAR 79
TAPE VL29, FILE 1, FLT 72

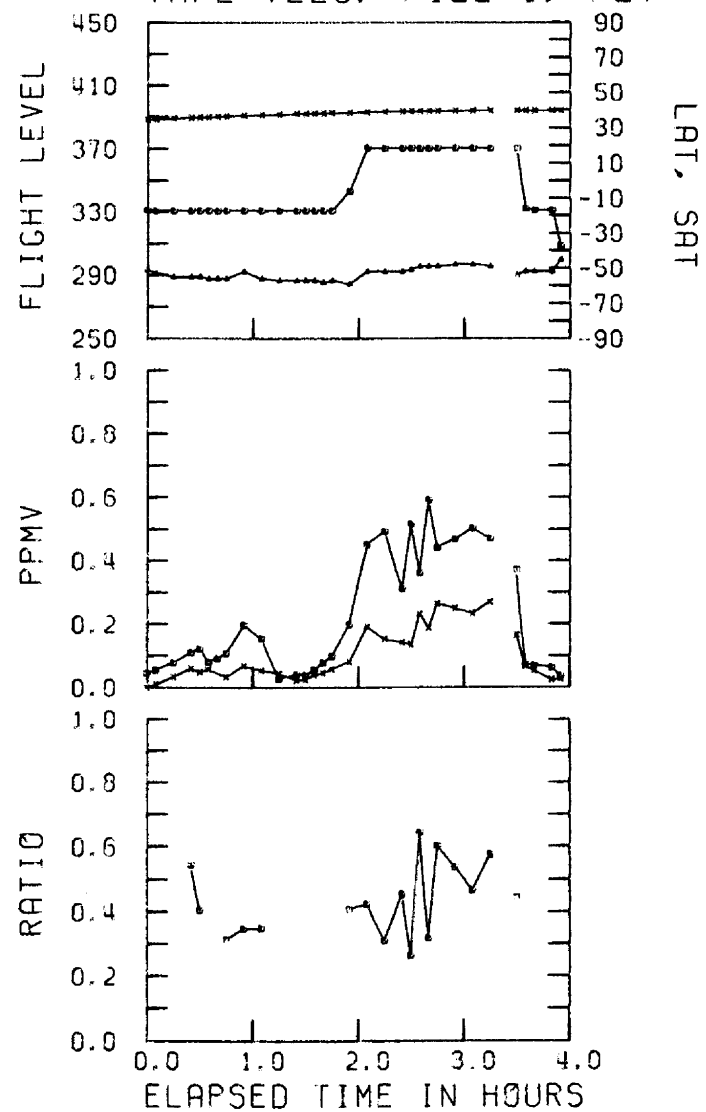


C-132

HNL TO LAX DEPARTURE 6 MAR 79
TAPE VL29, FILE 1, FLT 73

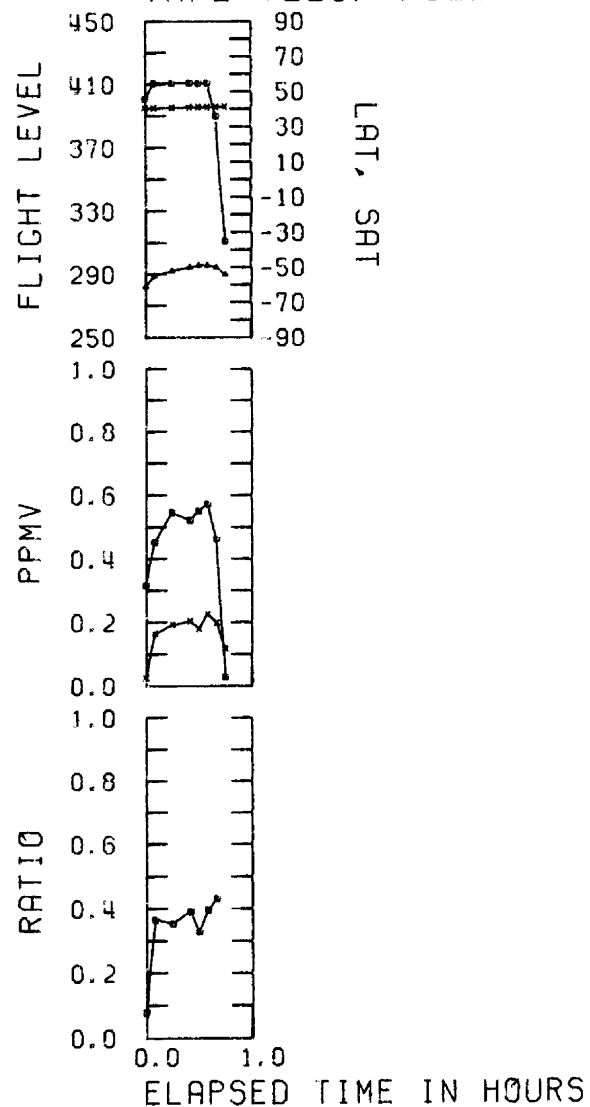


LAX TO JFK DEPARTURE 6 MAR 79
TAPE VL29, FILE 1, FLT 74

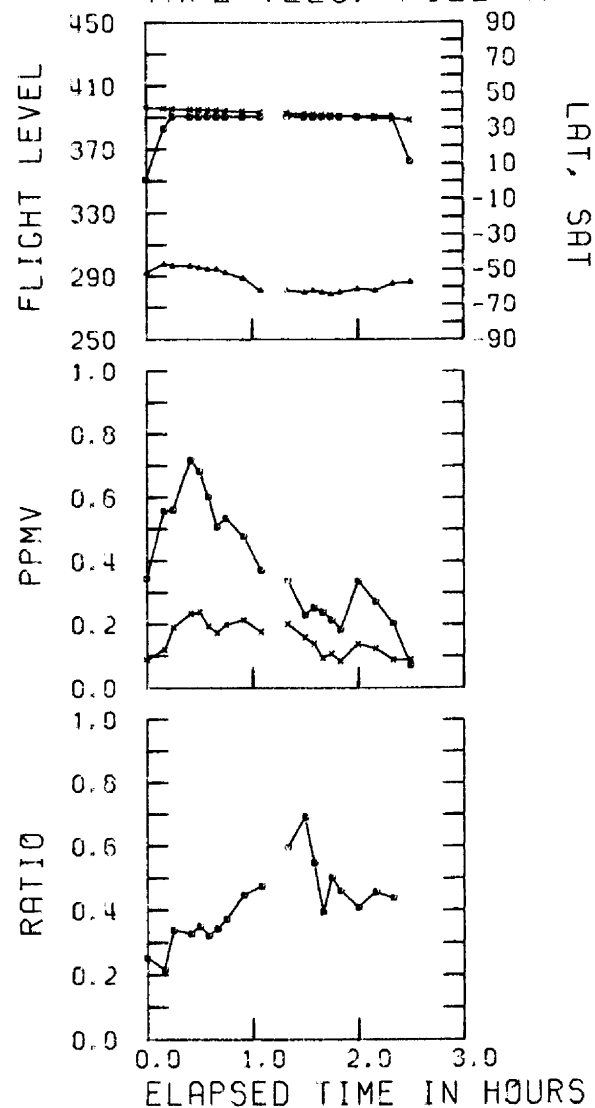


C-133

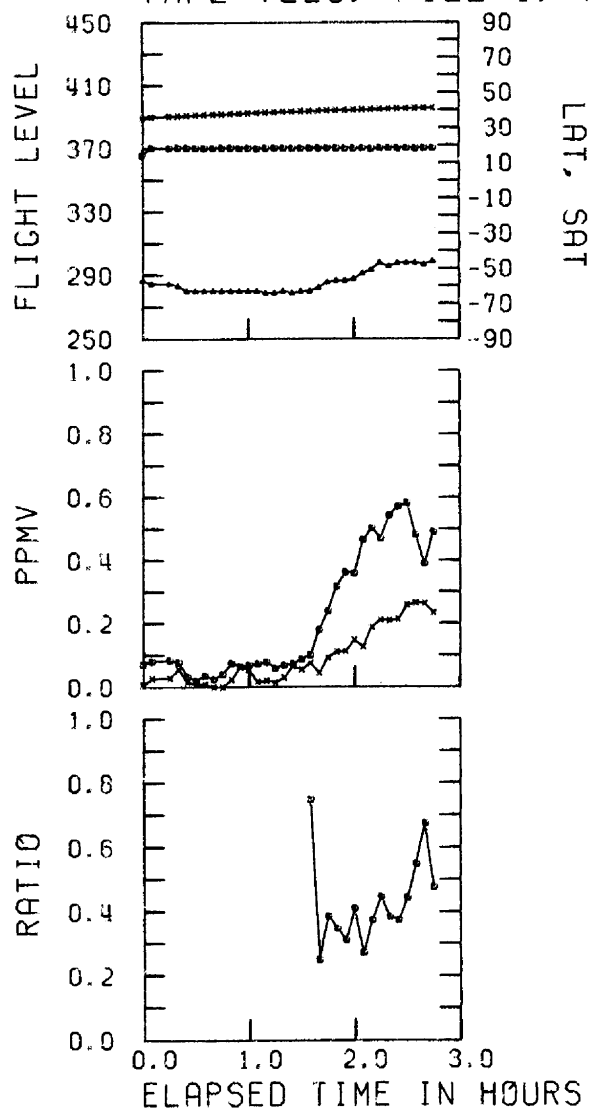
JFK TO ORD
DEPARTURE 6 MAR 79
TAPE VL29, FILE 1, FLT 75



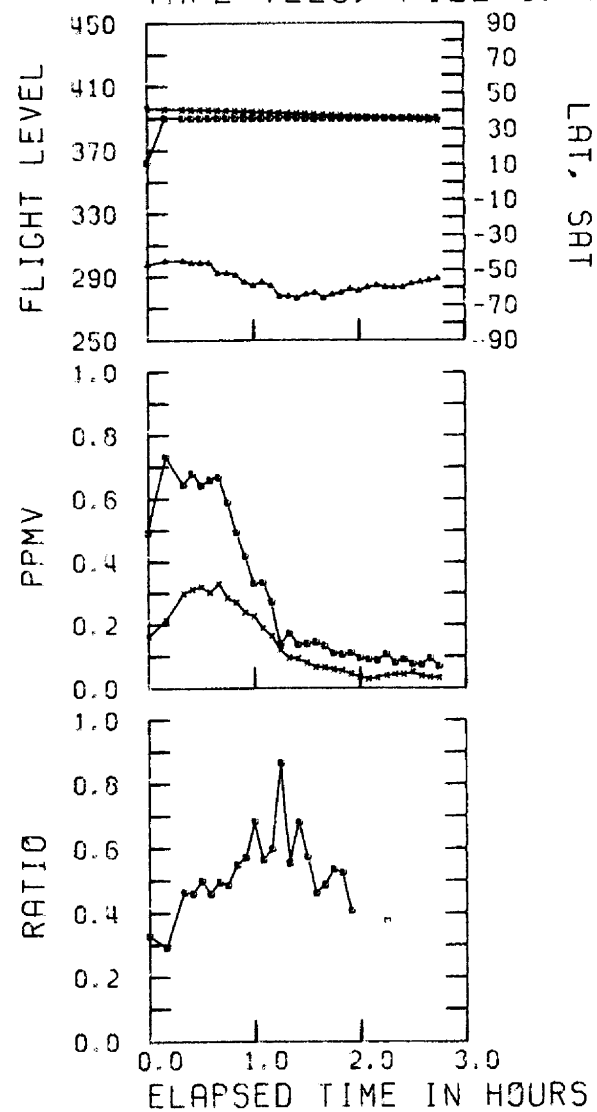
ORD TO LAX DEPARTURE 6 MAR 79
TAPE VL29, FILE 1, FLT 76



LAX TO ORD DEPARTURE 7 MAR 79
TAPE VL29, FILE 1, FLT 77

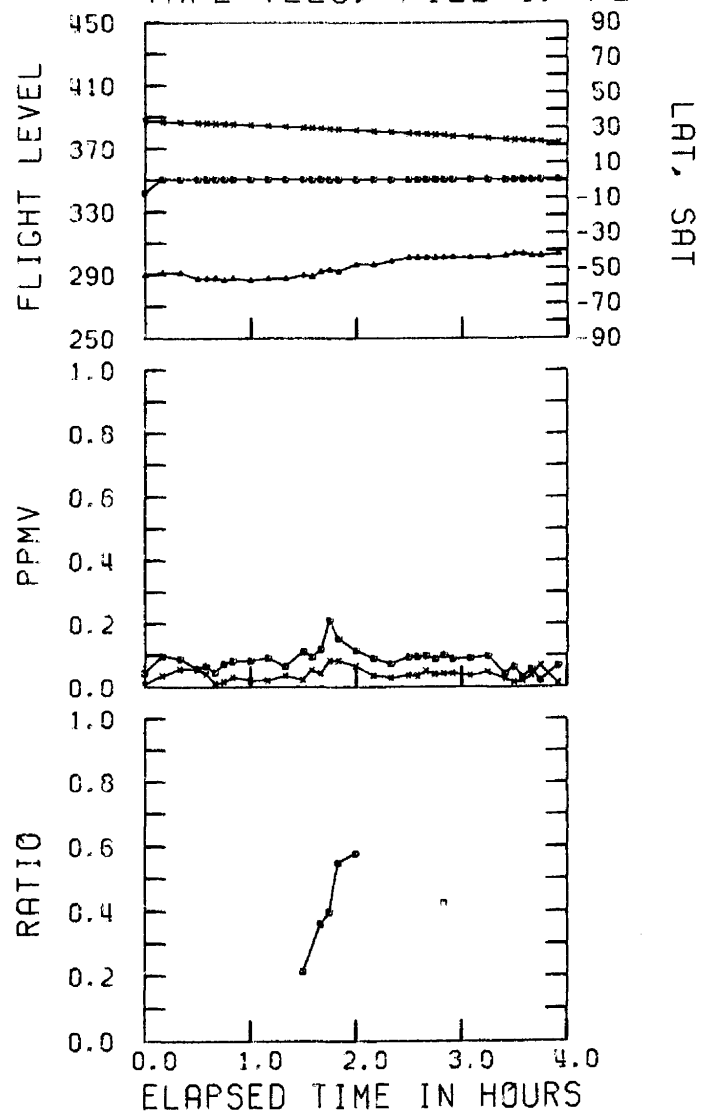


ORD TO LAX DEPARTURE 7 MAR 79
TAPE VL29, FILE 1, FLT 78

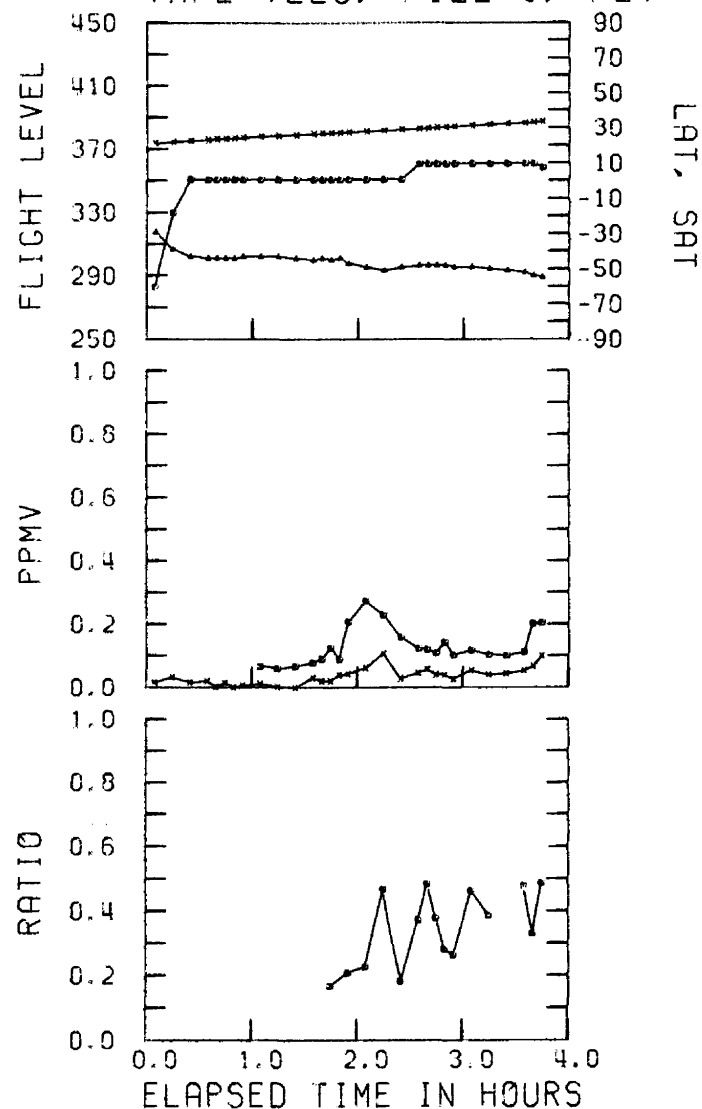


C-135

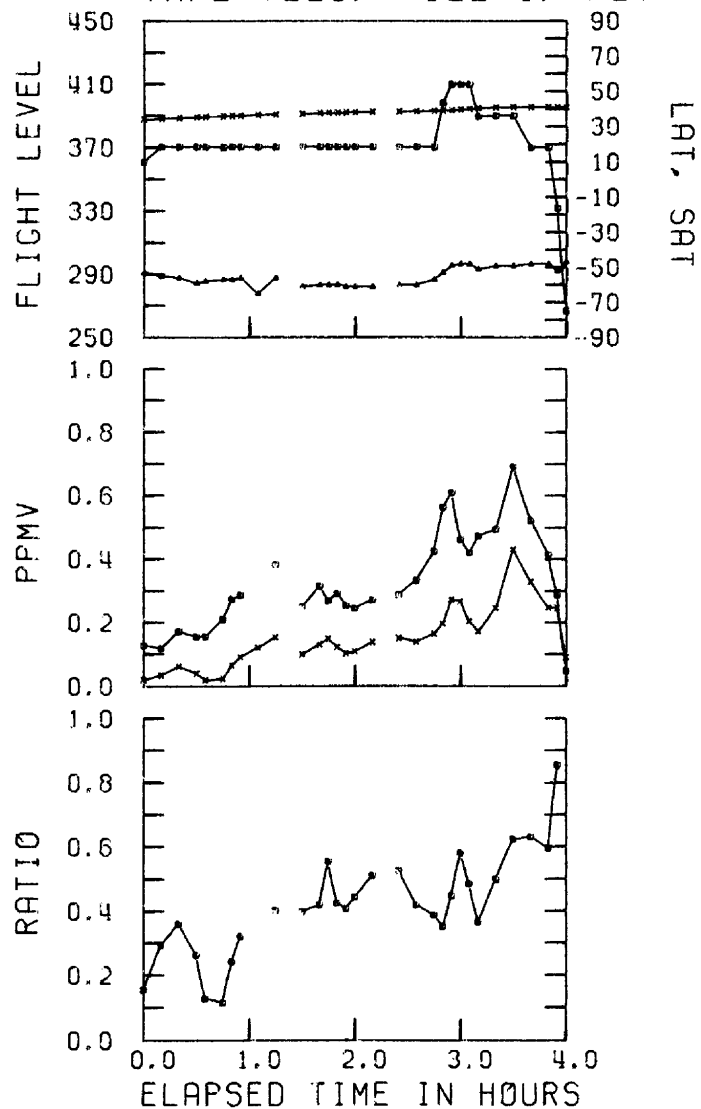
LAX TO HNL DEPARTURE 7 MAR 79
TAPE VL29, FILE 1, FLT 79



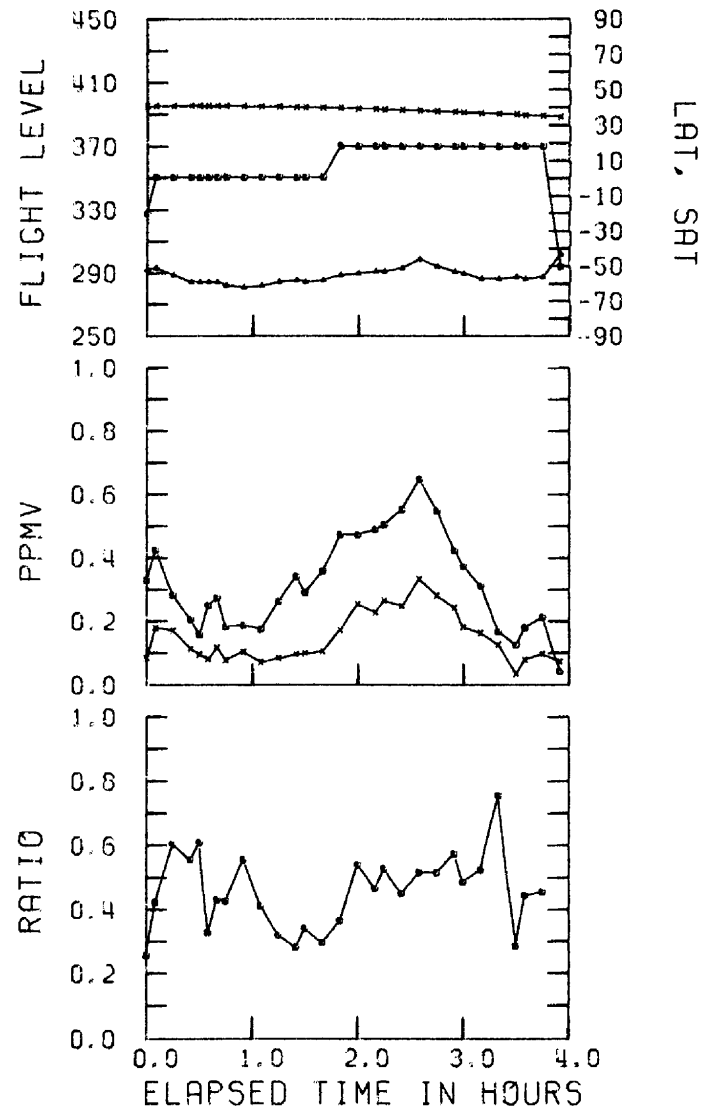
ITO TO LAX DEPARTURE 8 MAR 79
TAPE VL29, FILE 1, FLT 81



LAX TO JFK DEPARTURE 8 MAR 79
TAPE VL29, FILE 1, FLT 82



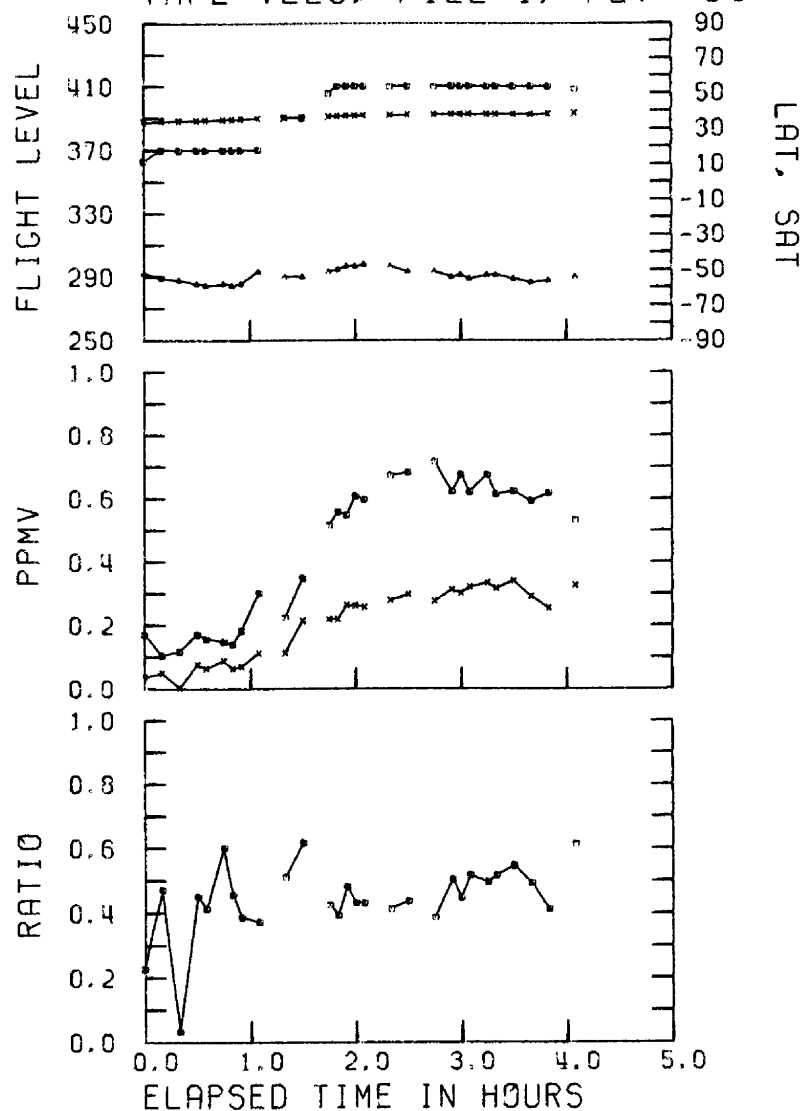
JFK TO LAX DEPARTURE 9 MAR 79
TAPE VL29, FILE 1, FLT 83



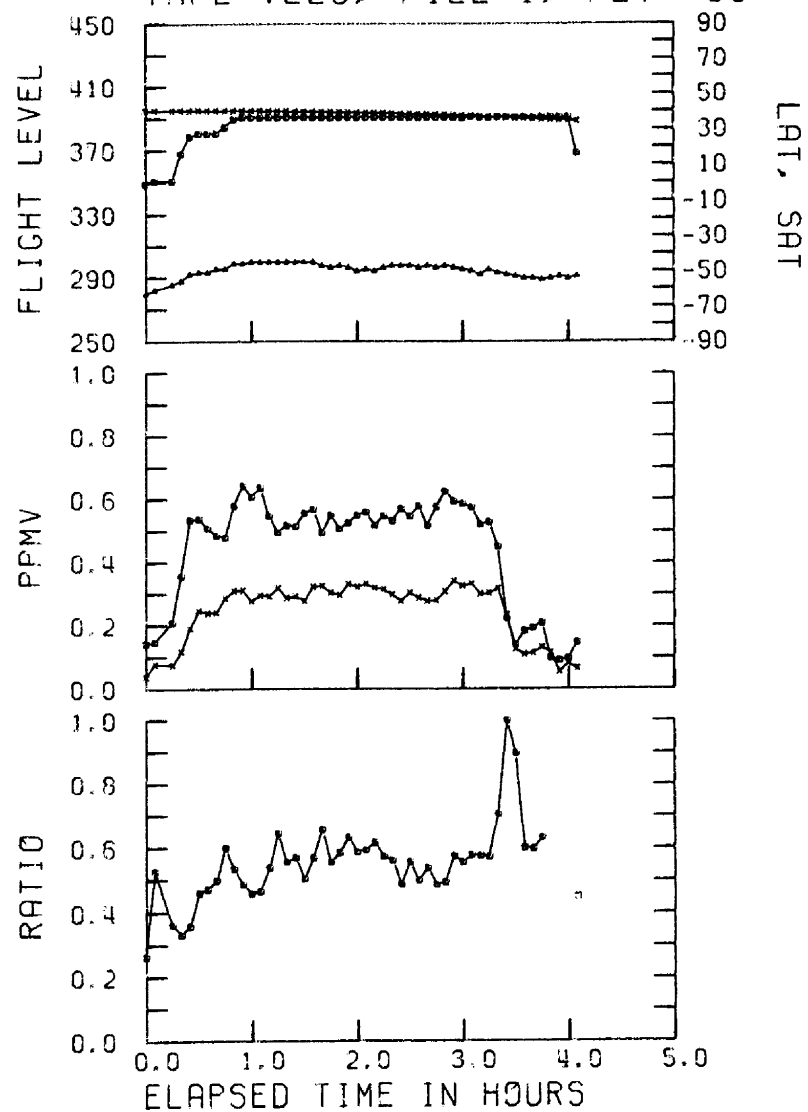
C-136

C-137

LAX TO JFK DEPARTURE 9 MAR 79
TAPE VL29, FILE 1, FLT 84

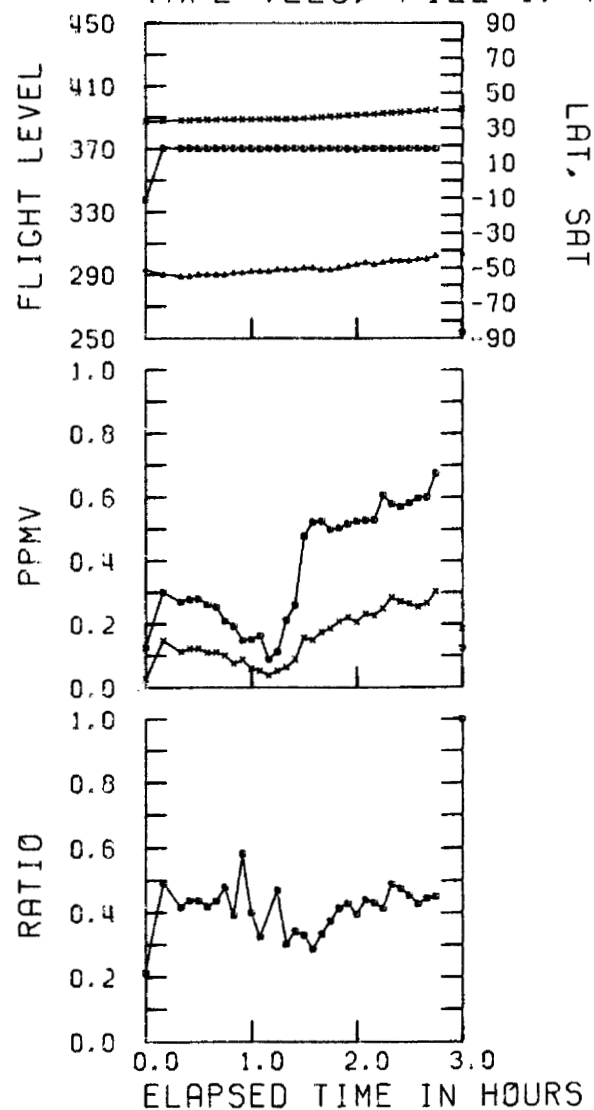


JFK TO LAX DEPARTURE 10 MAR 79
TAPE VL29, FILE 1, FLT 85

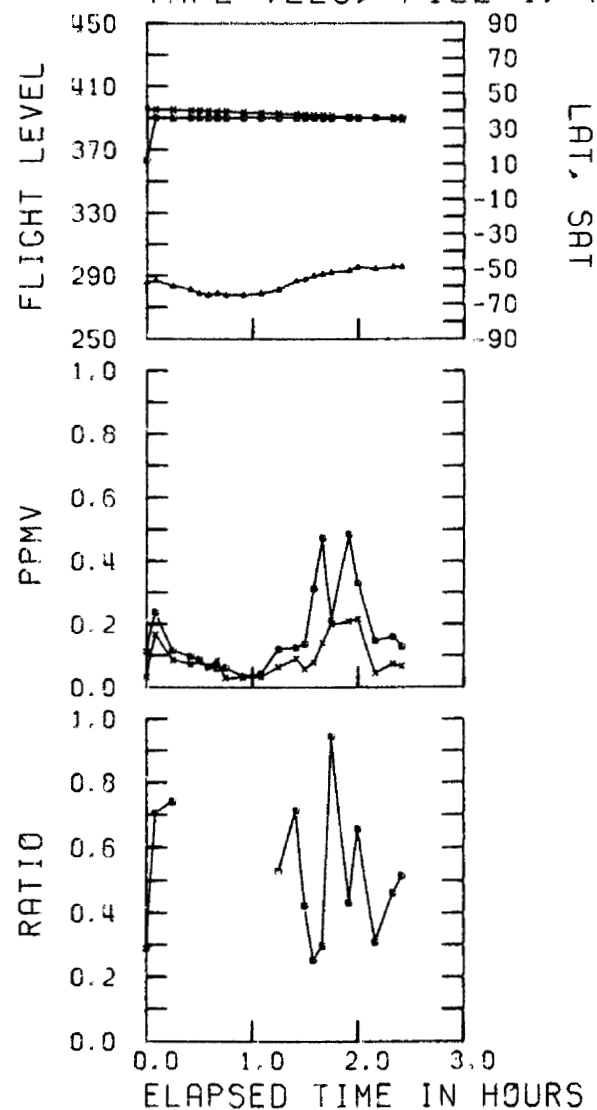


881-C

LAX TO ORD DEPARTURE 10 MAR 79
TAPE VL29, FILE 1, FLT 86

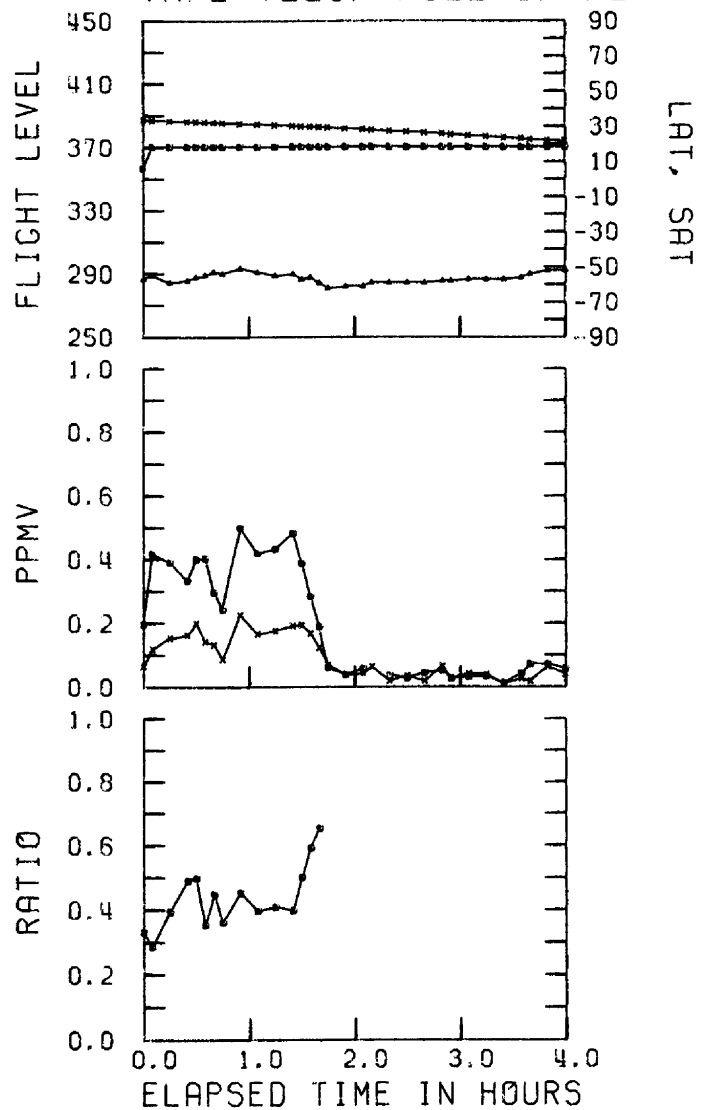


ORD TO LAX DEPARTURE 11 MAR 79
TAPE VL29, FILE 1, FLT 89

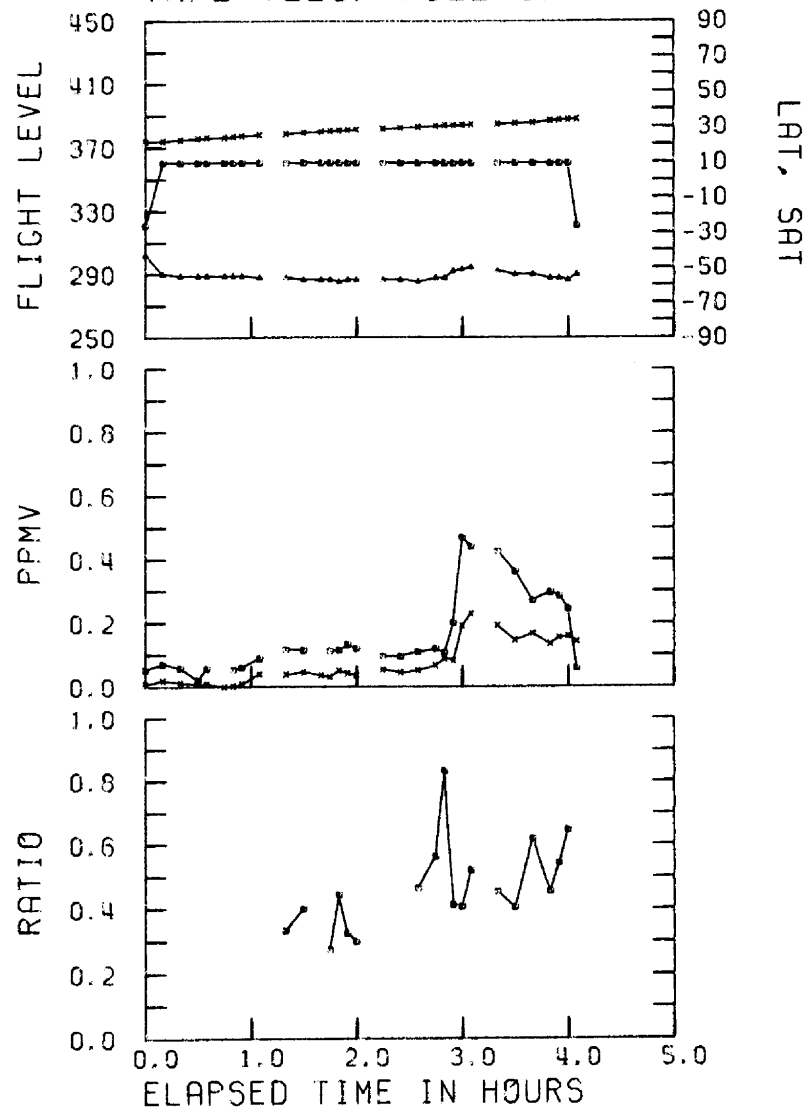


LAX TO HNL DEPARTURE 12 MAR 79
TAPE VL29, FILE 1, FLT 90

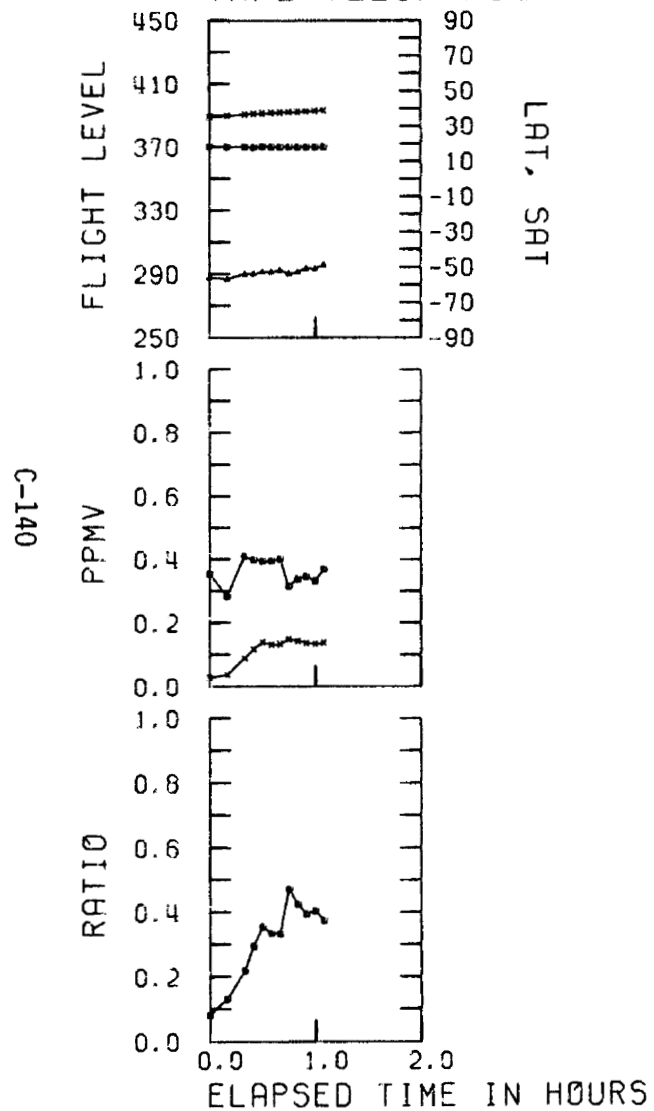
C-139



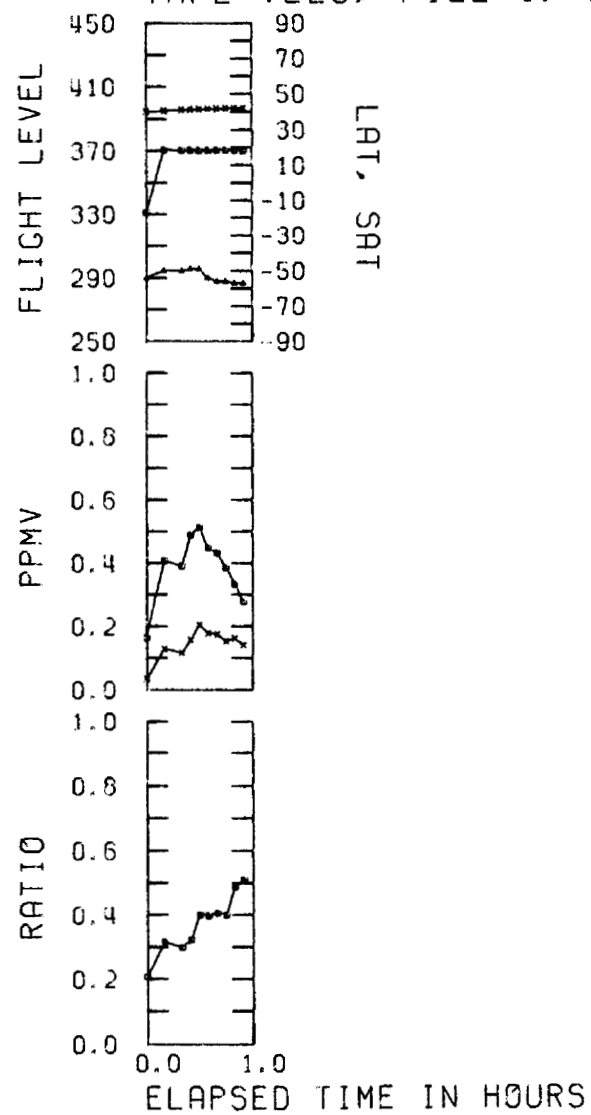
HNL TO LAX DEPARTURE 12 MAR 79
TAPE VL29, FILE 1, FLT 91



LAX TO DEN DEPARTURE 13 MAR 79
TAPE VL29, FILE 1, FLT 92

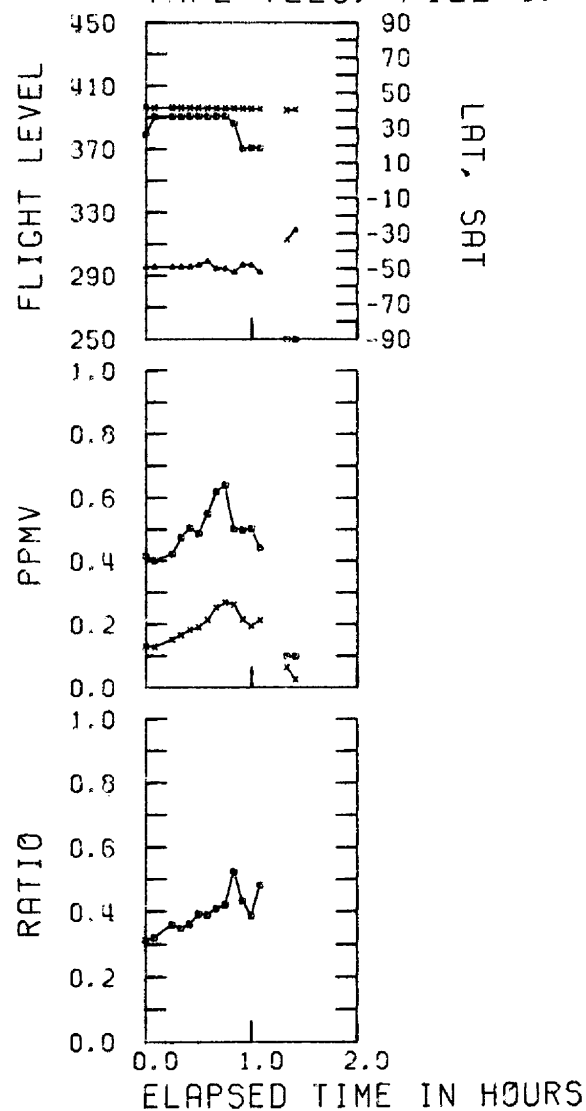


DEN TO ORD DEPARTURE 13 MAR 79
TAPE VL29, FILE 1, FLT 93

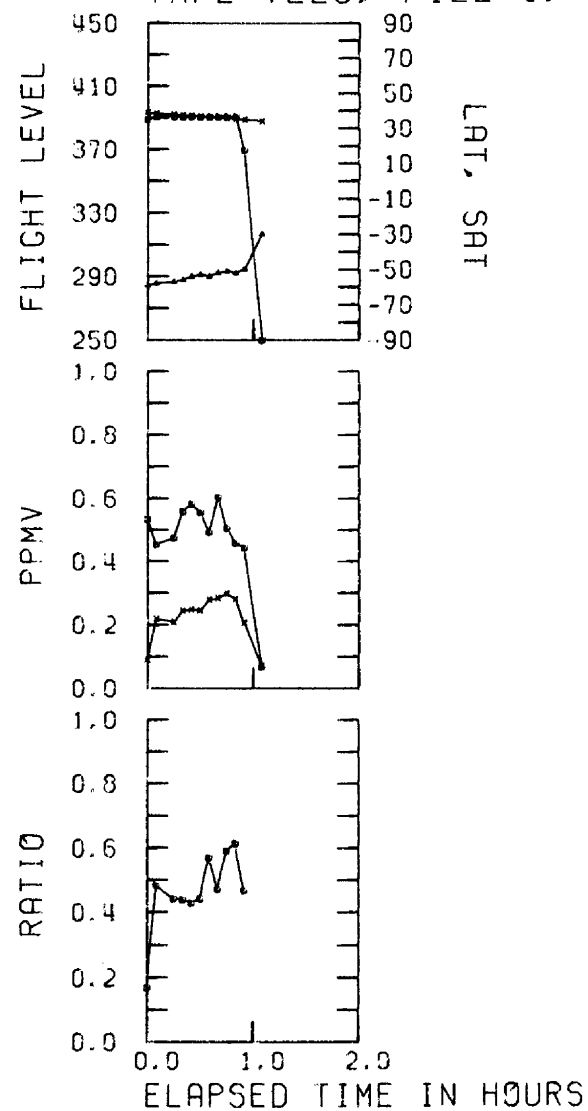


C-141

ORD TO DEN DEPARTURE 13 MAR 79
TAPE VL29, FILE 1, FLT 94

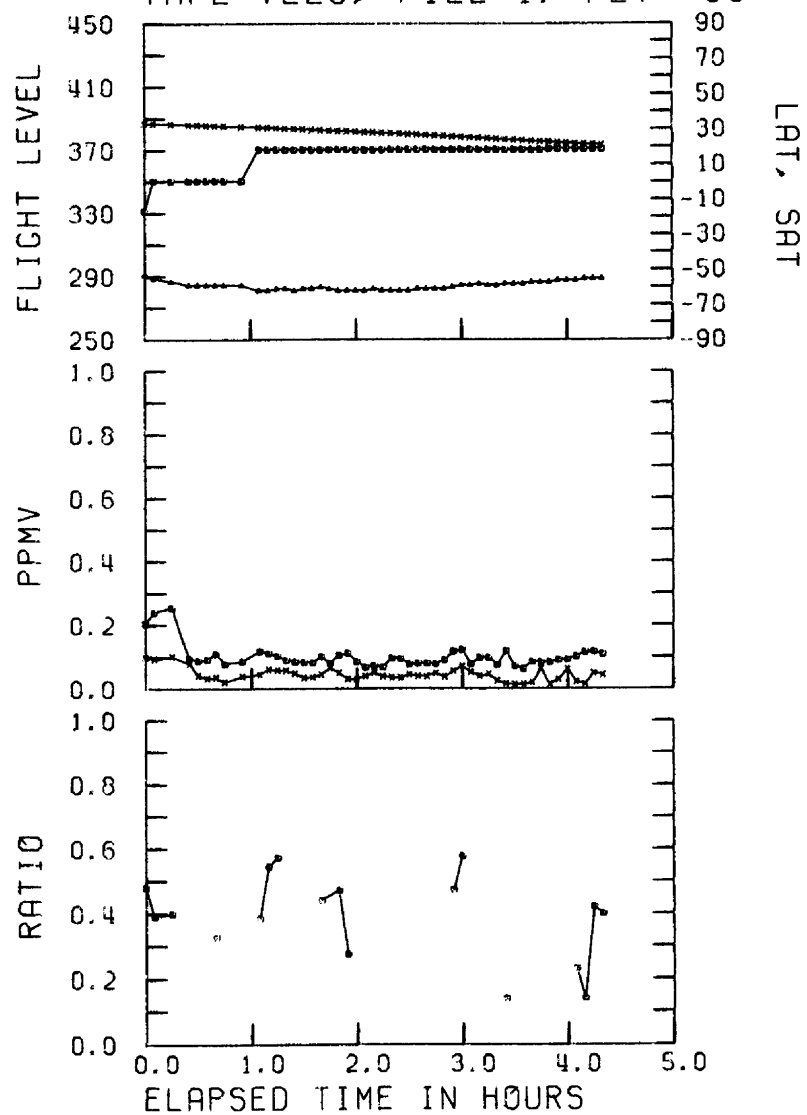


DEN TO LAX DEPARTURE 13 MAR 79
TAPE VL29, FILE 1, FLT 95

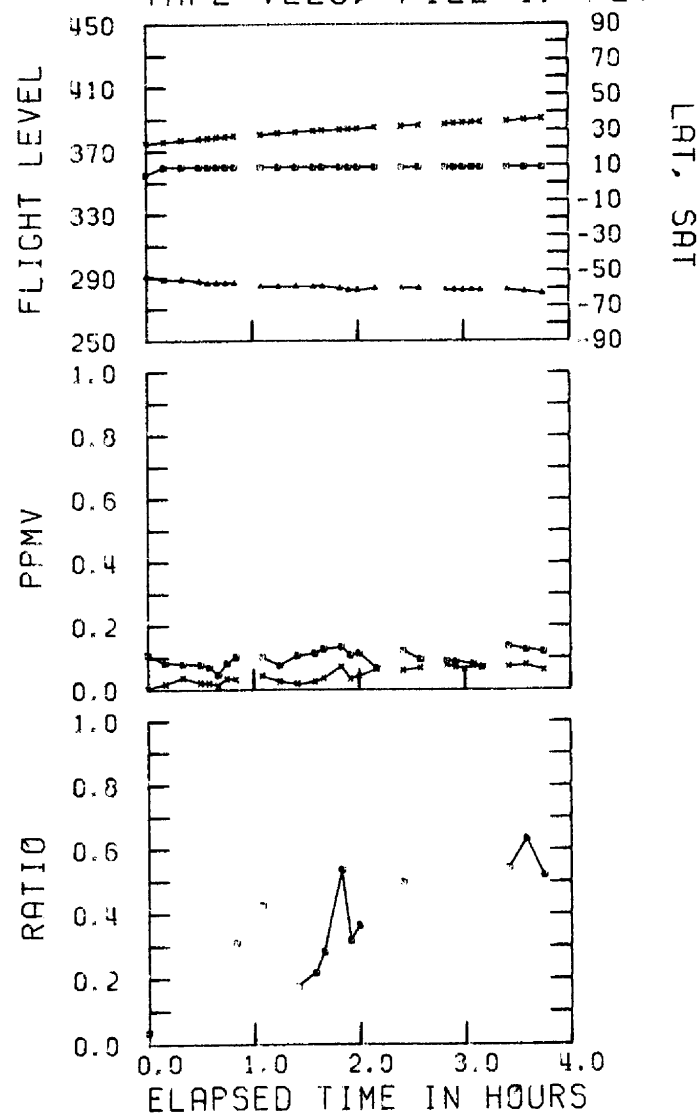


C-142

LAX TO HNL DEPARTURE 13 MAR 79
TAPE VL29, FILE 1, FLT 96

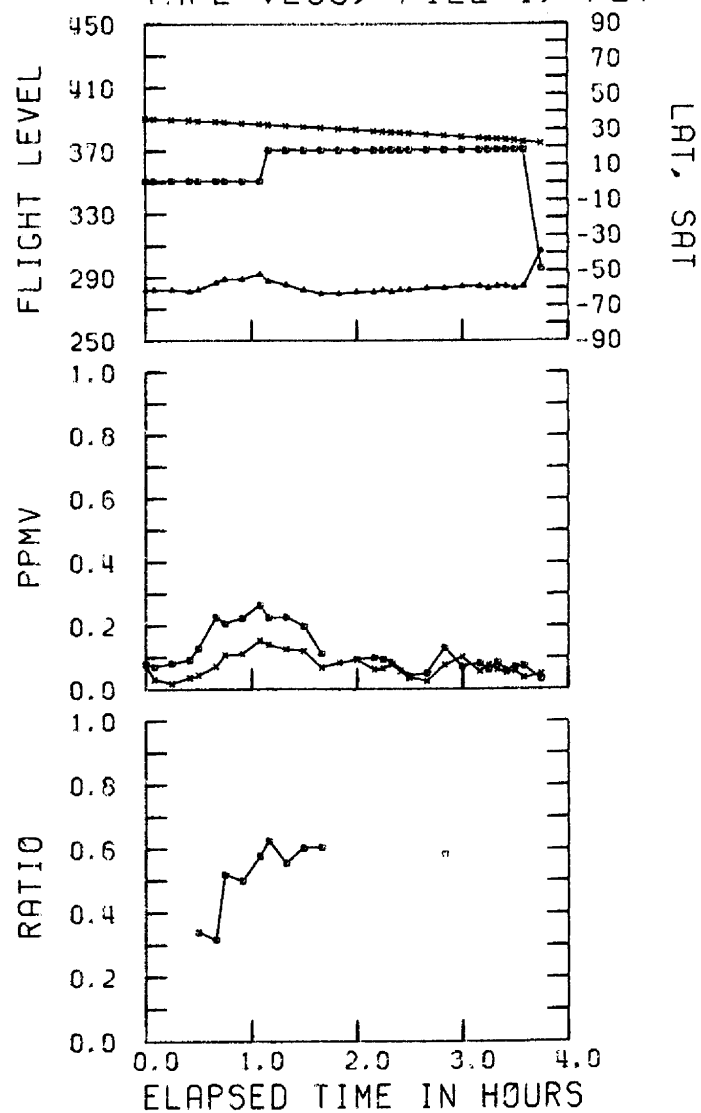


HNL TO SFO DEPARTURE 14 MAR 79
TAPE VL29, FILE 1, FLT 97

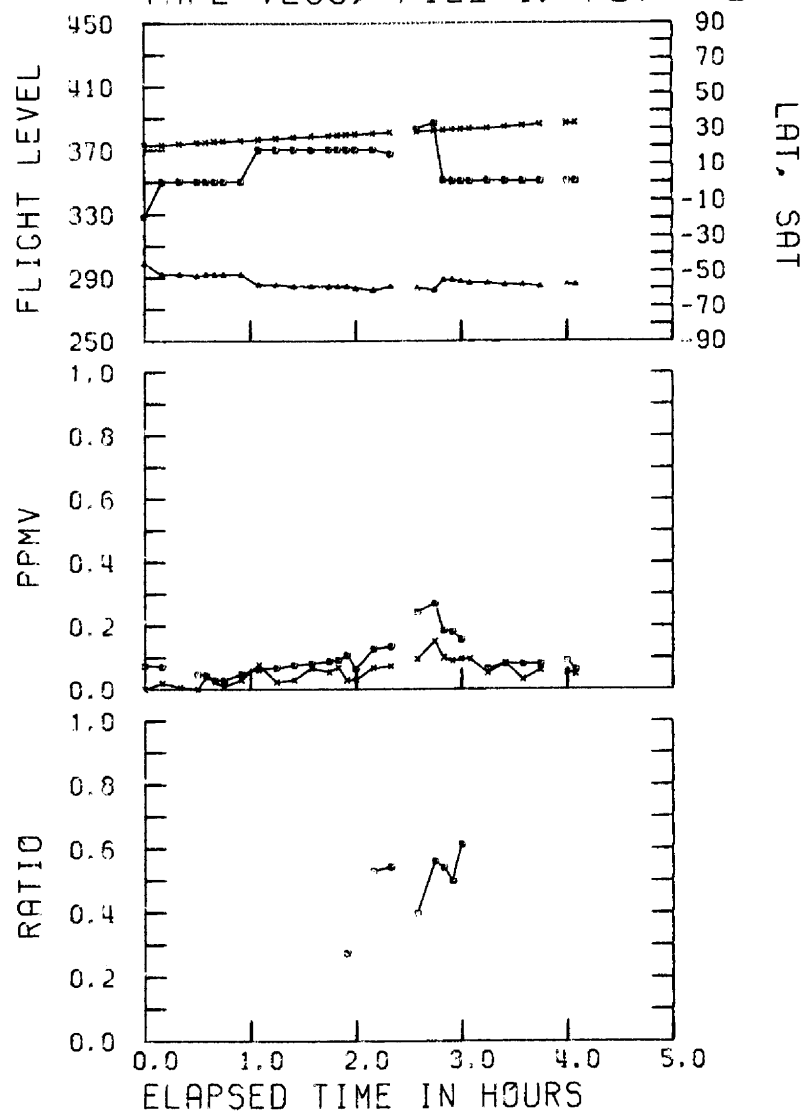


C-143

SFO TO HNL DEPARTURE 14 MAR 79
TAPE VL30, FILE 1, FLT 1

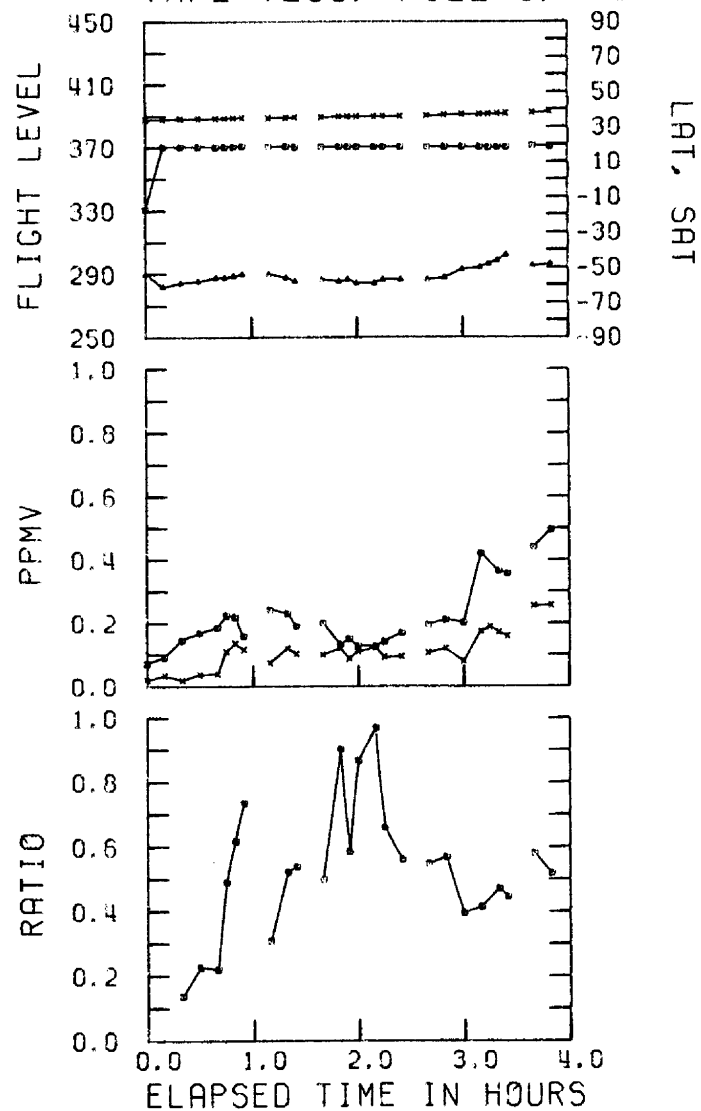


HNL TO LAX DEPARTURE 15 MAR 79
TAPE VL30, FILE 1, FLT 2

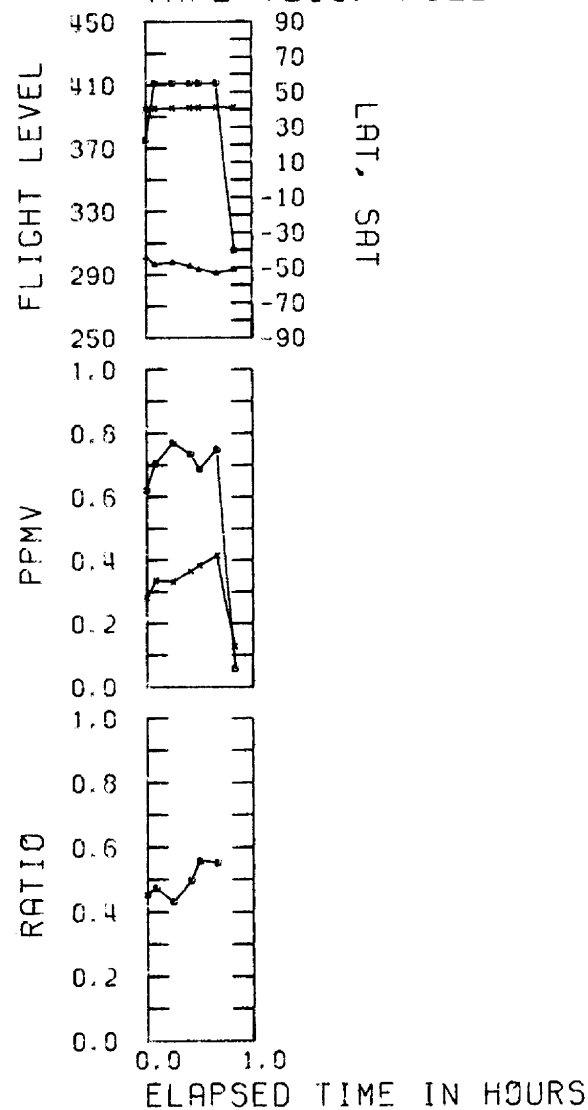


C-144

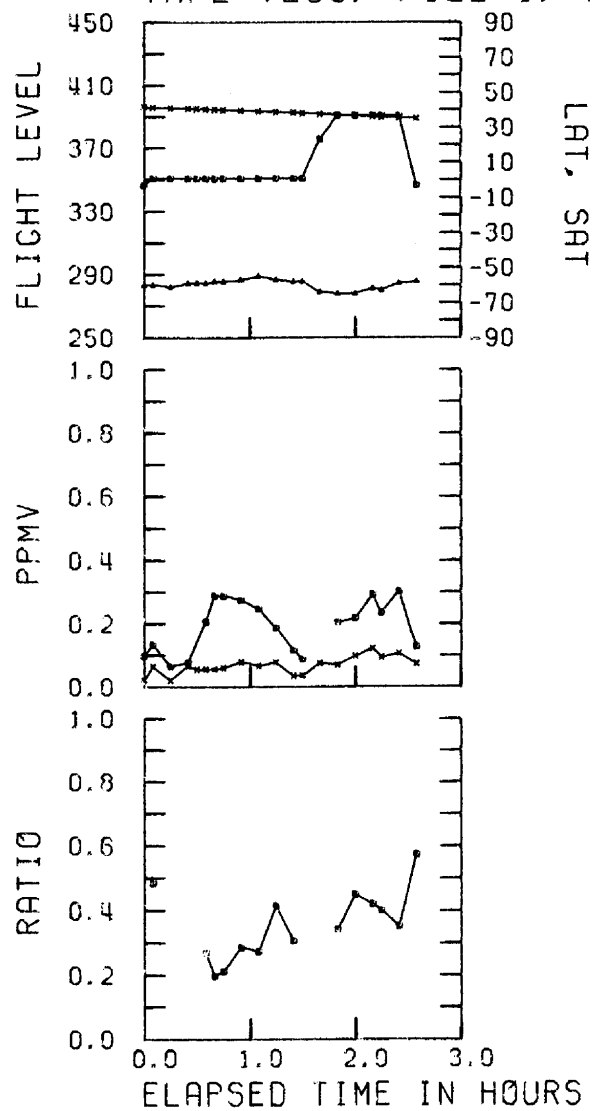
LAX TO JFK DEPARTURE 15 MAR 79
TAPE VL30, FILE 1, FLT 3



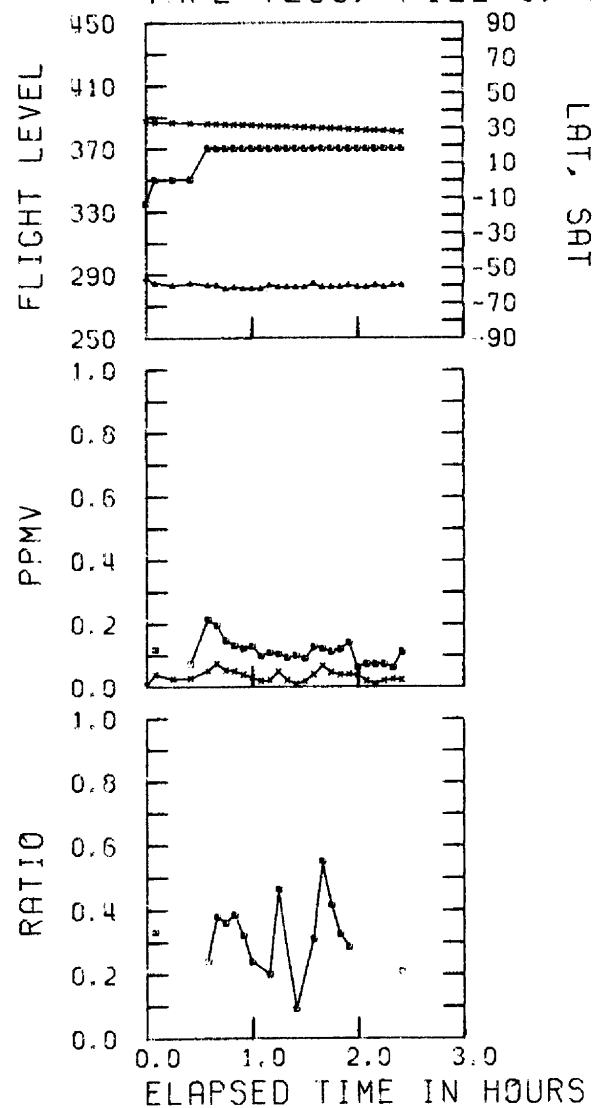
JFK TO ORD
DEPARTURE 15 MAR 79
TAPE VL30, FILE 1, FLT 4



ORD TO LAX DEPARTURE 15 MAR 79
TAPE VL30, FILE 1, FLT 5



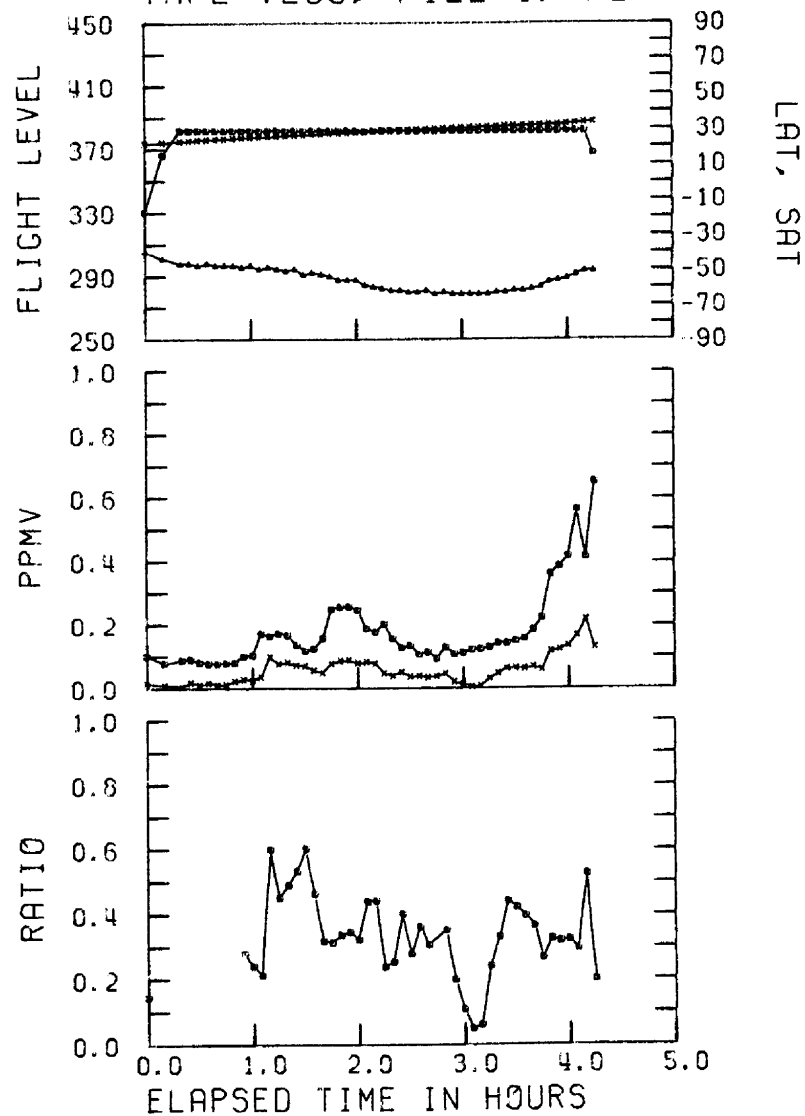
LAX TO HNL DEPARTURE 16 MAR 79
TAPE VL30, FILE 1, FLT 6



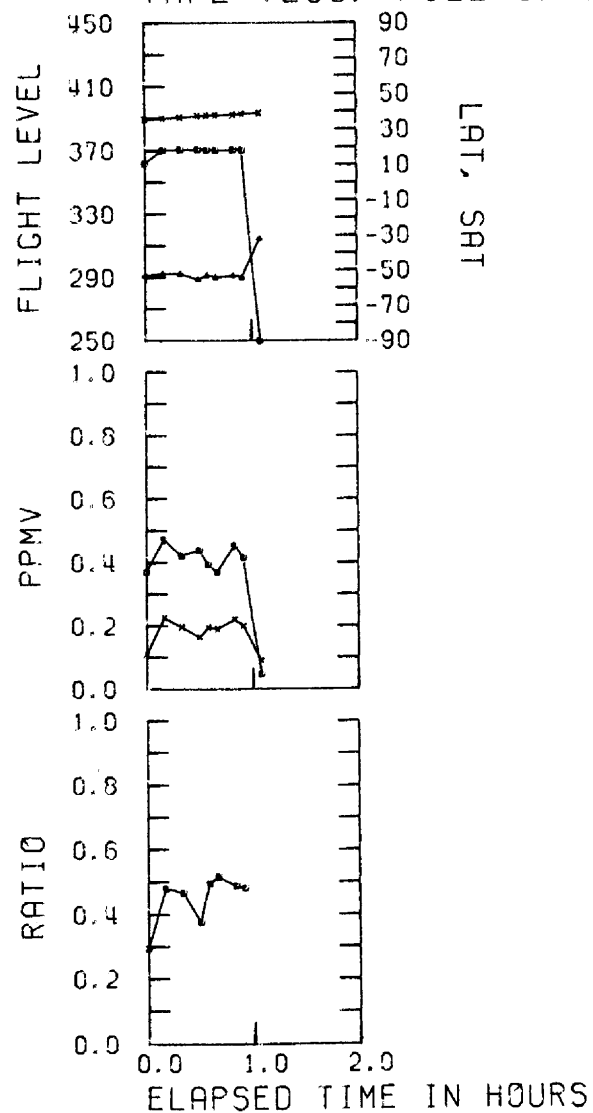
C-145

C-146

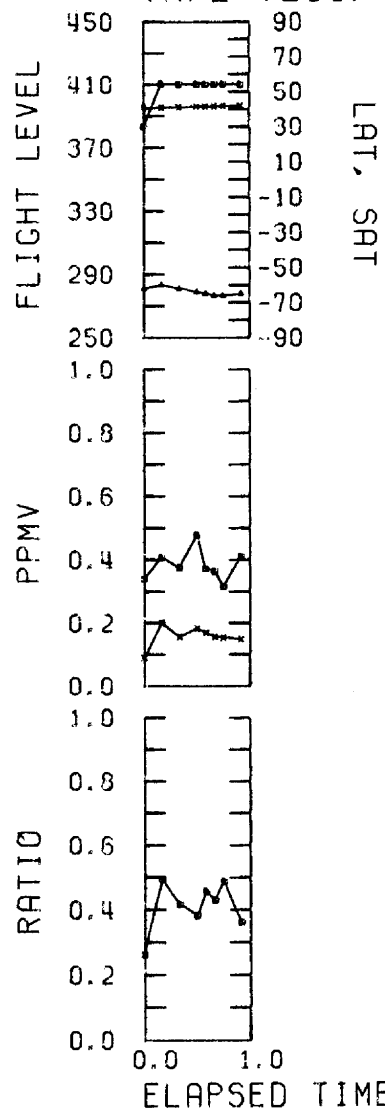
HNL TO LAX DEPARTURE 16 MAR 79
TAPE VL30, FILE 1, FLT 7



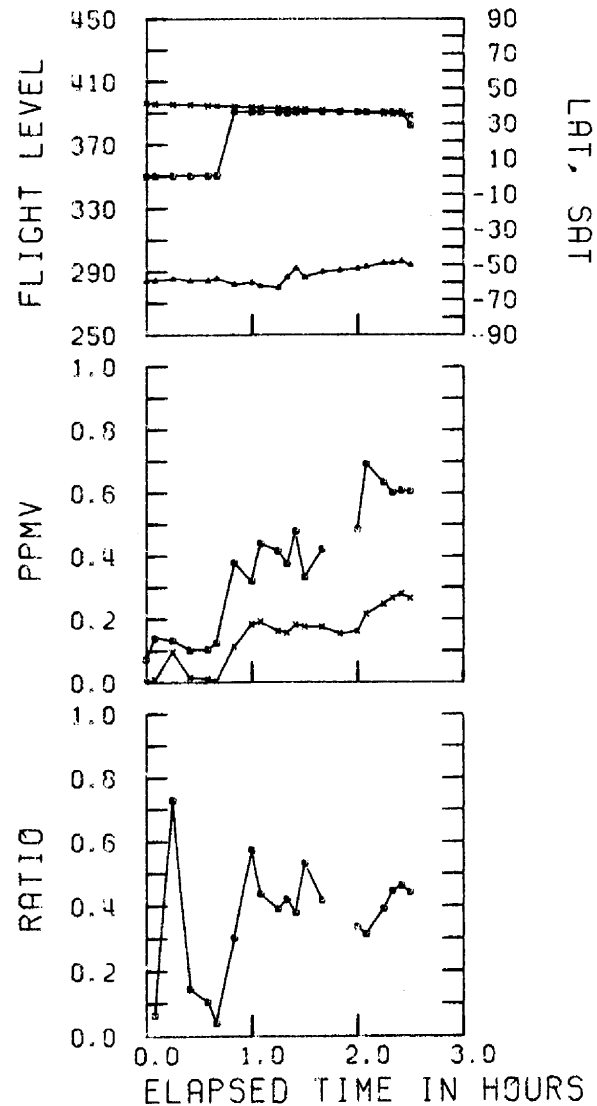
LAX TO DEN
DEPARTURE 17 MAR 79
TAPE VL30, FILE 1, FLT 8



DEN TO ORD DEPARTURE 17 MAR 79
TAPE VL30, FILE 1, FLT 9

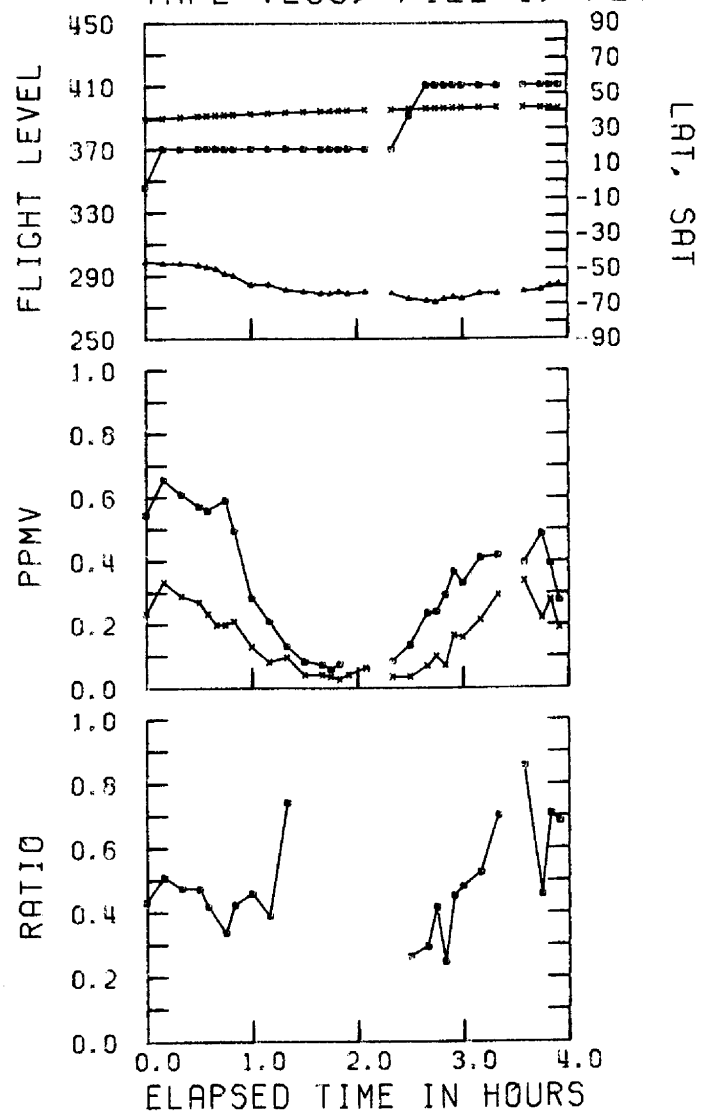


ORD TO LAX DEPARTURE 17 MAR 79
TAPE VL30, FILE 1, FLT 10

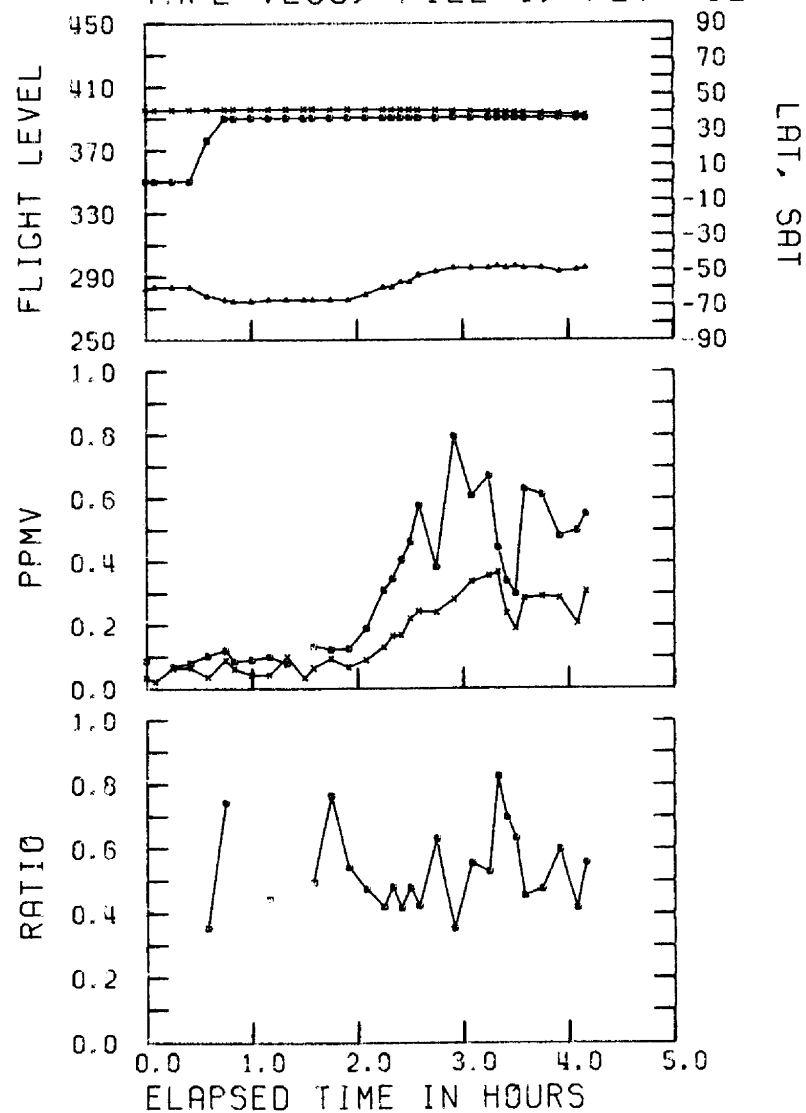


C-147

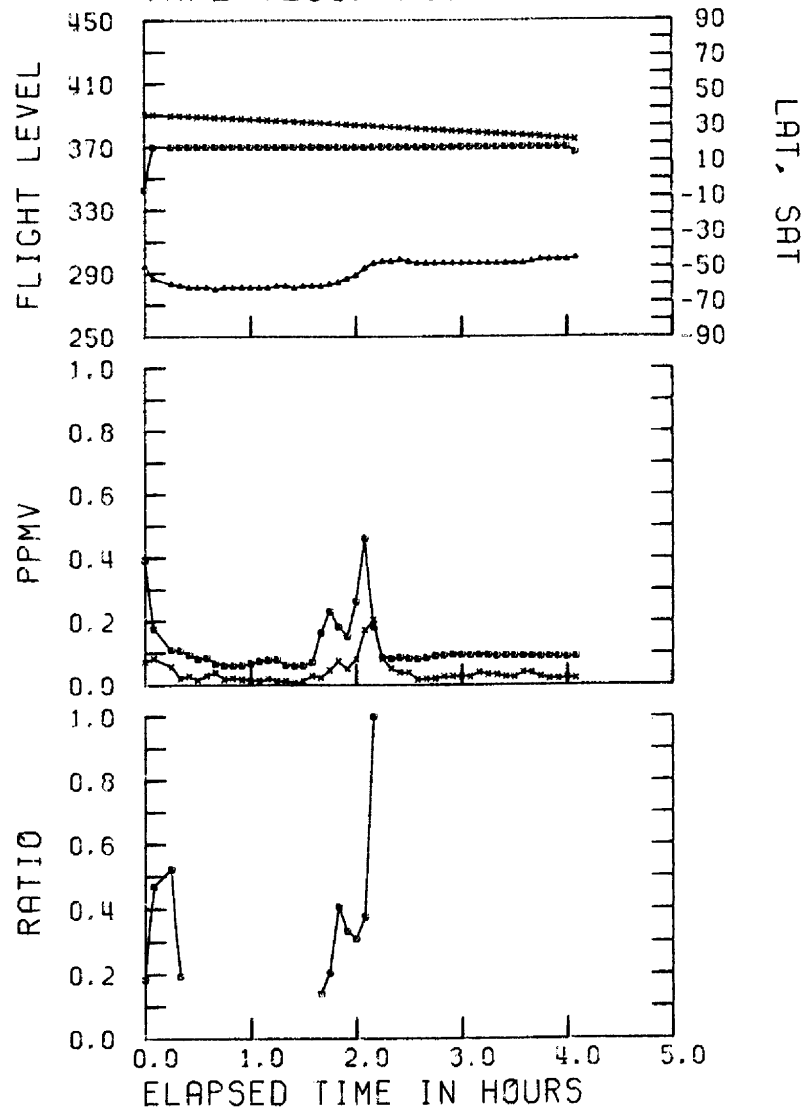
LAX TO JFK DEPARTURE 17 MAR 79
TAPE VL30, FILE 1, FLT 11



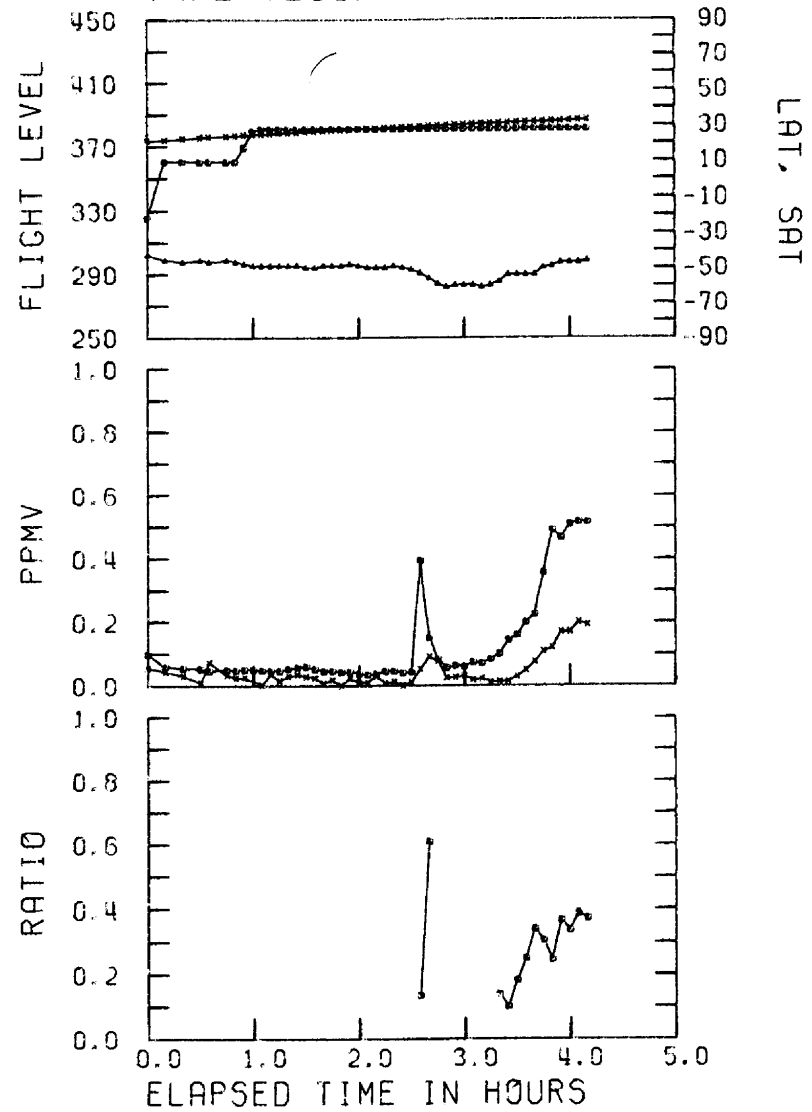
JFK TO SFO DEPARTURE 18 MAR 79
TAPE VL30, FILE 1, FLT 12



SFO TO HNL DEPARTURE 19 MAR 79
TAPE VL30, FILE 1, FLT 13

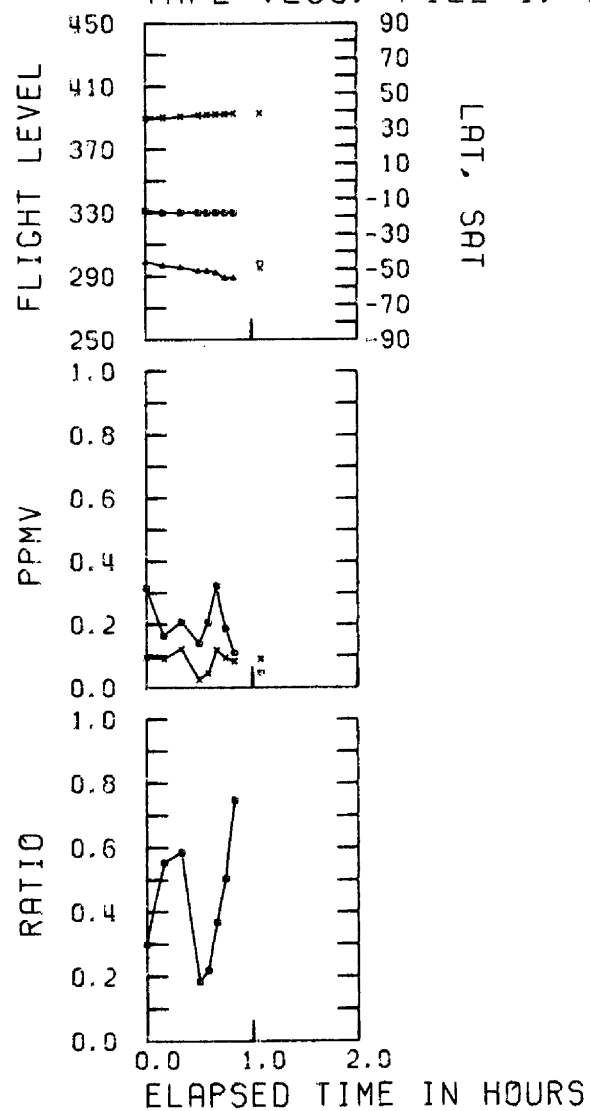


HNL TO LAX DEPARTURE 19 MAR 79
TAPE VL30, FILE 1, FLT 14

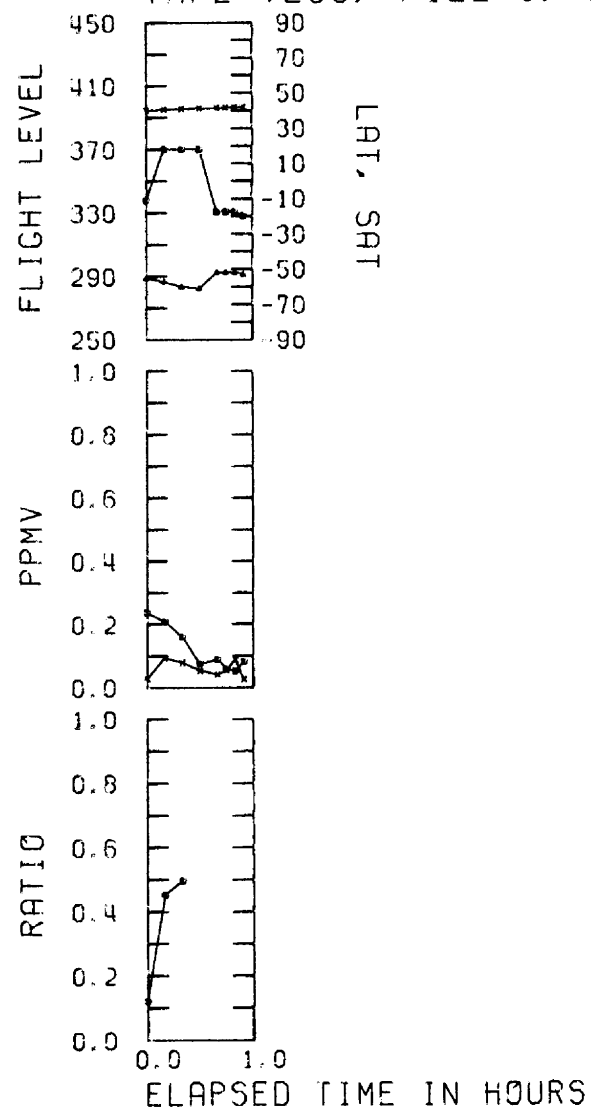


C-150

LAX TO DEN DEPARTURE 20 MAR 79
TAPE VL30, FILE 1, FLT 15

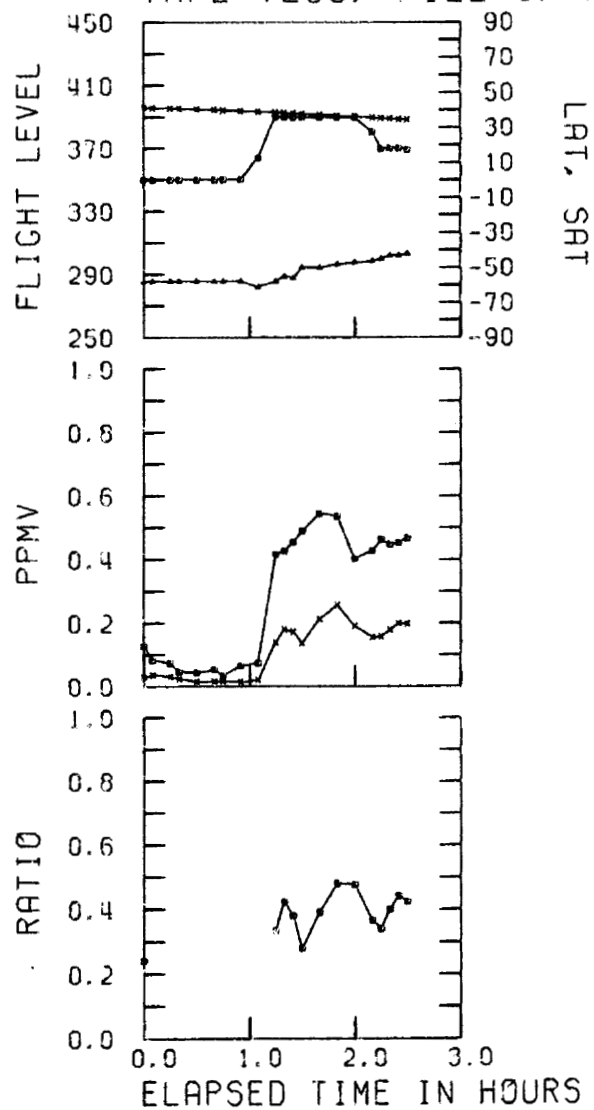


DEN TO ORD
DEPARTURE 20 MAR 79
TAPE VL30, FILE 1, FLT 16

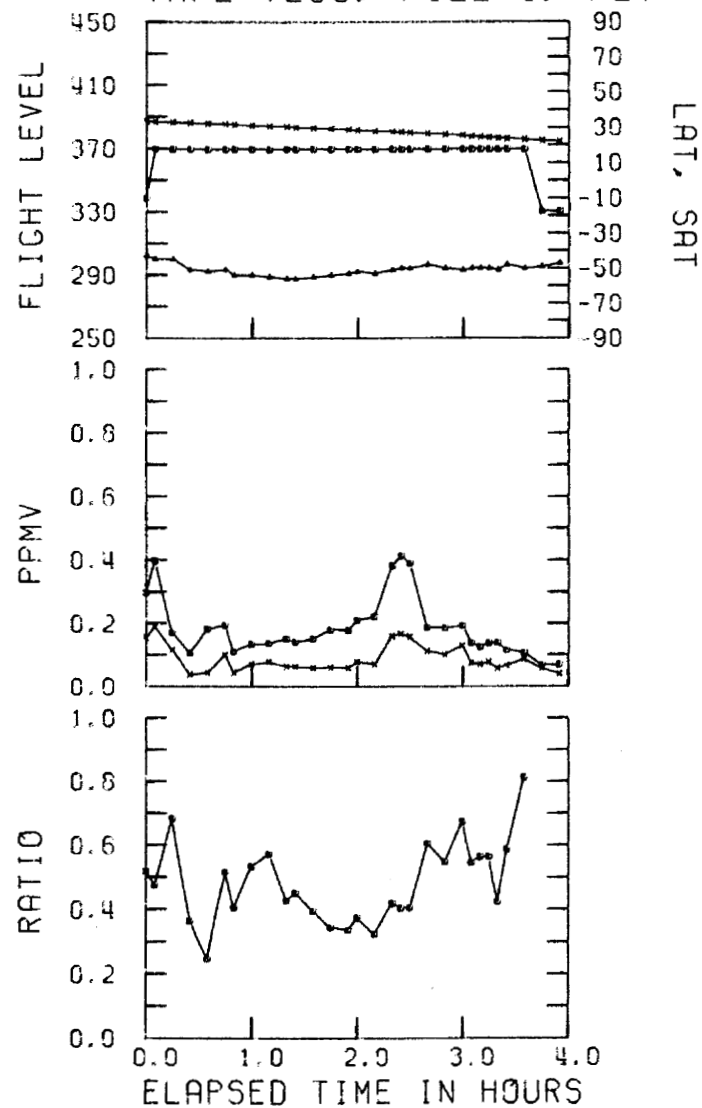


C-151

ORD TO LAX DEPARTURE 20 MAR 79
TAPE VL30, FILE 1, FLT 17

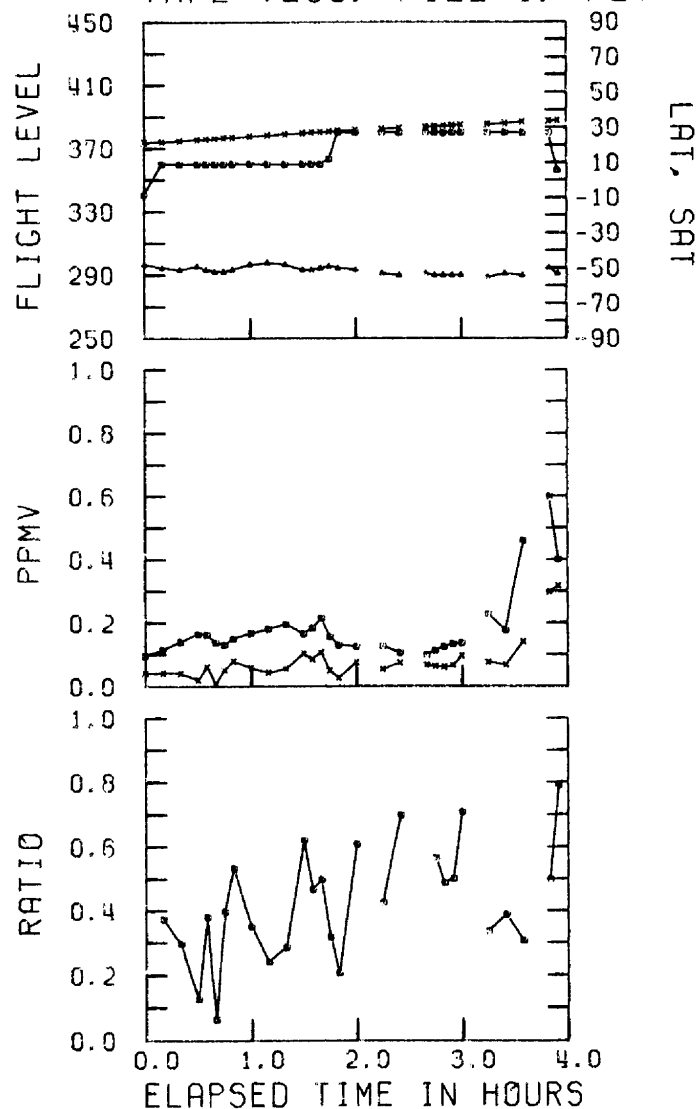


LAX TO HNL DEPARTURE 21 MAR 79
TAPE VL30, FILE 1, FLT 18

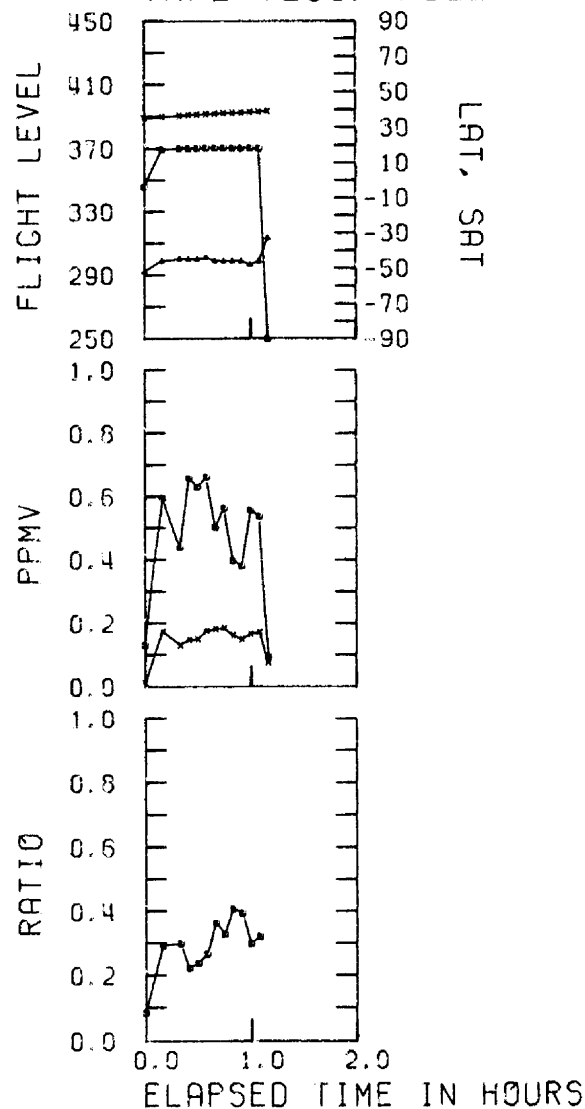


C-152

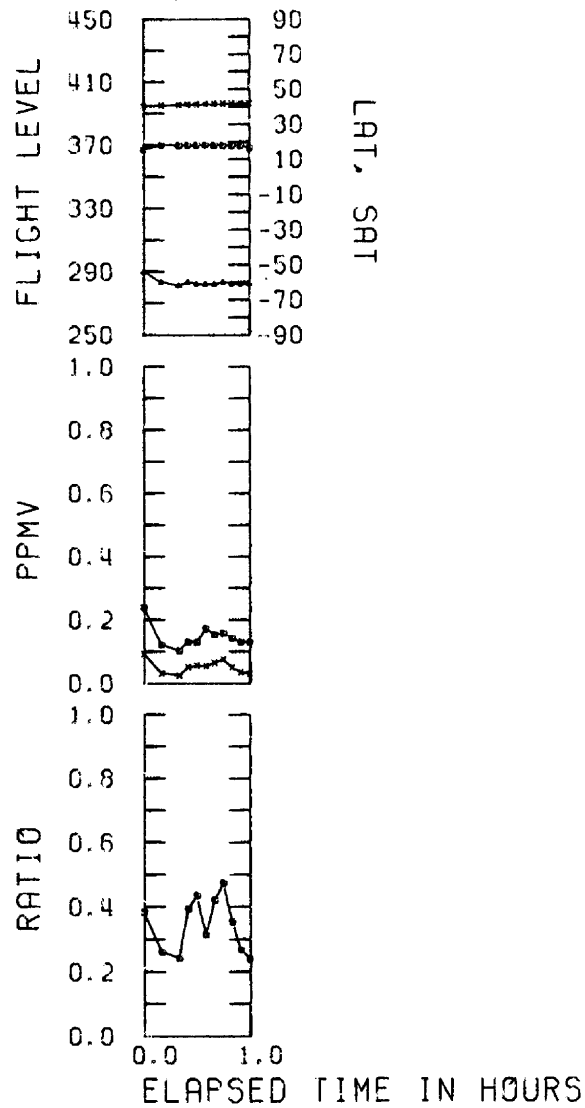
HNL TO LAX DEPARTURE 21 MAR 79
TAPE VL30, FILE 1, FLT 19



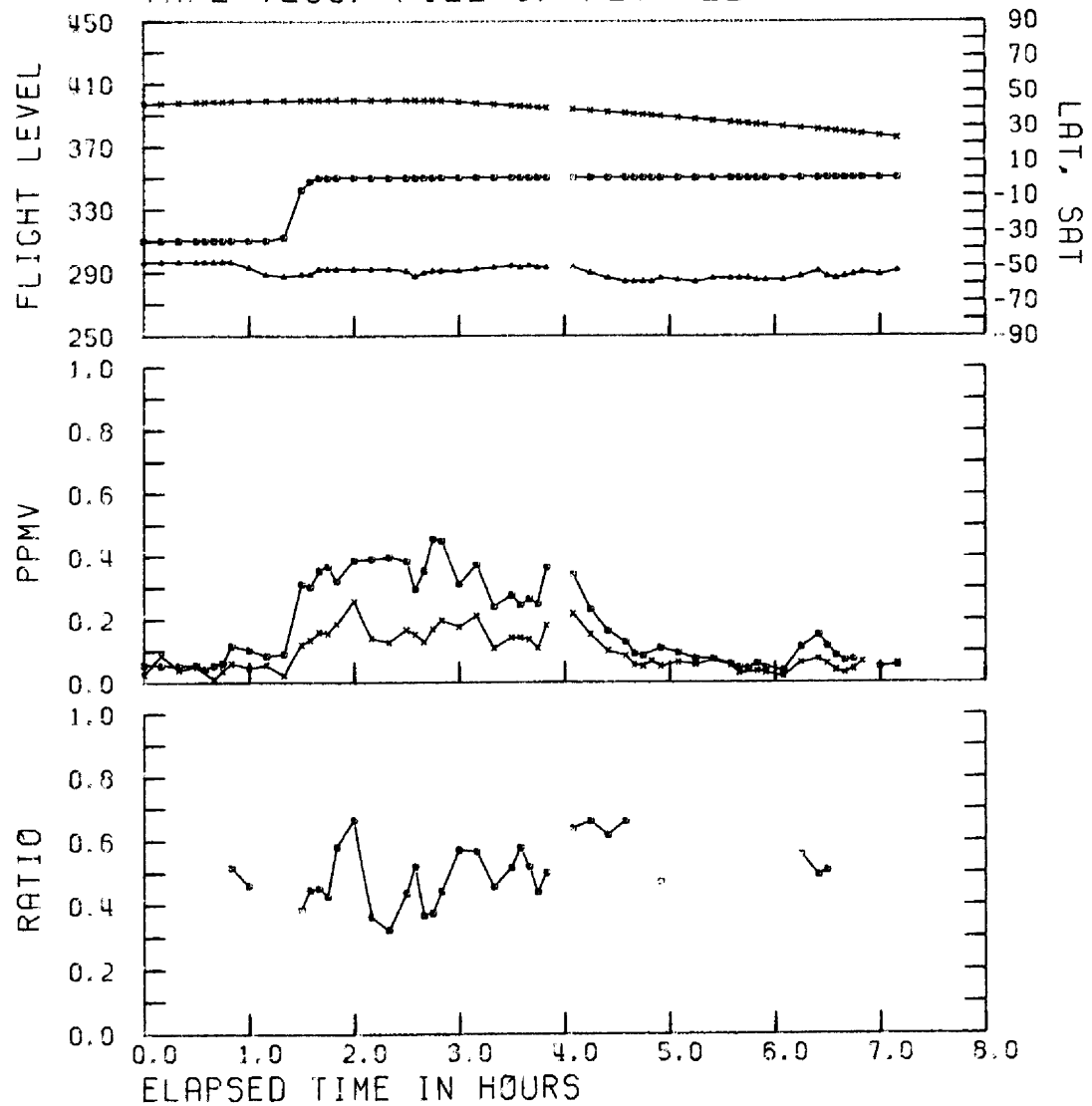
LAX TO DEN
DEPARTURE 22 MAR 79
TAPE VL30, FILE 1, FLT 20



DEN TO ORD
 DEPARTURE 22 MAR 79
 TAPE VL30,
 FILE 1, FLT 21

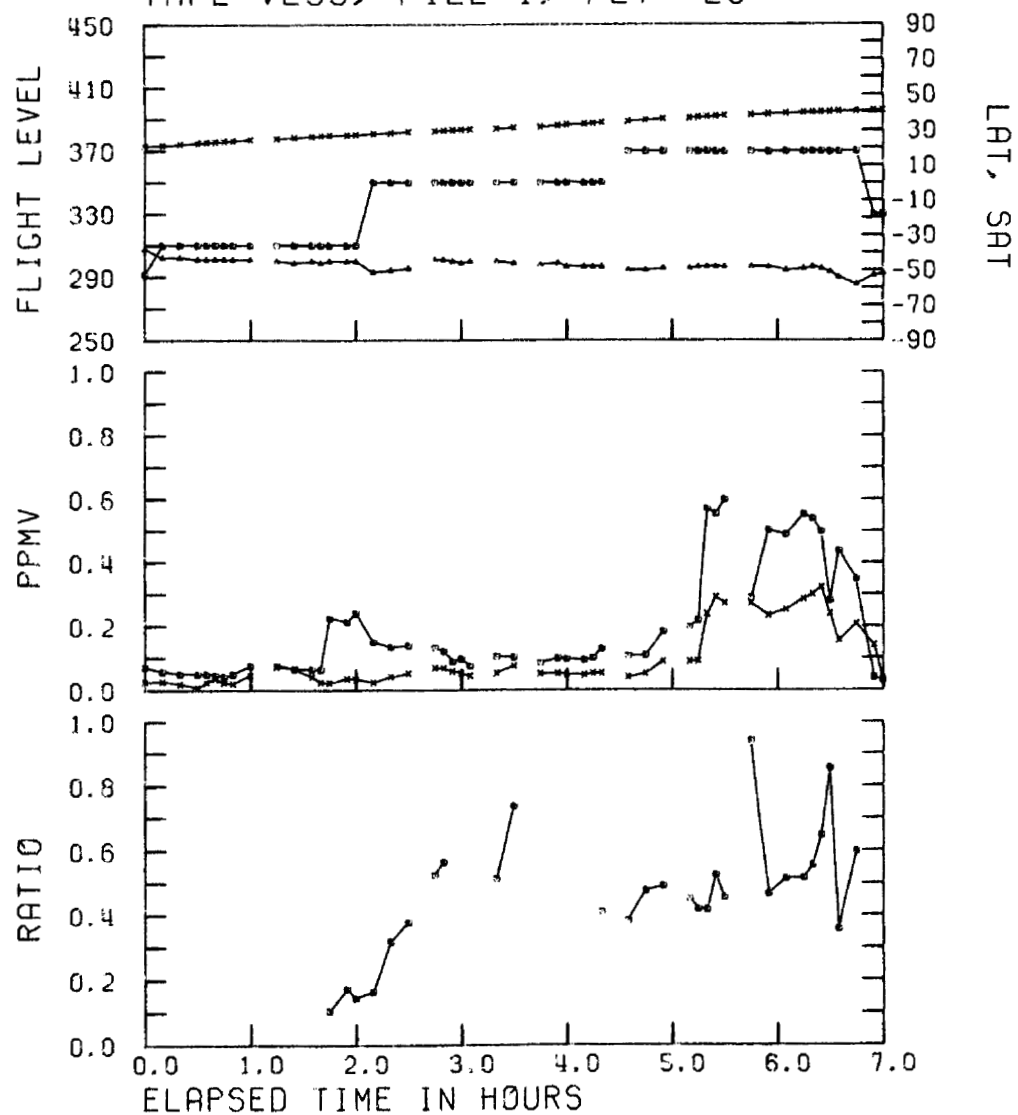


ORD TO HNL DEPARTURE 22 MAR 79
 TAPE VL30, FILE 1, FLT 22

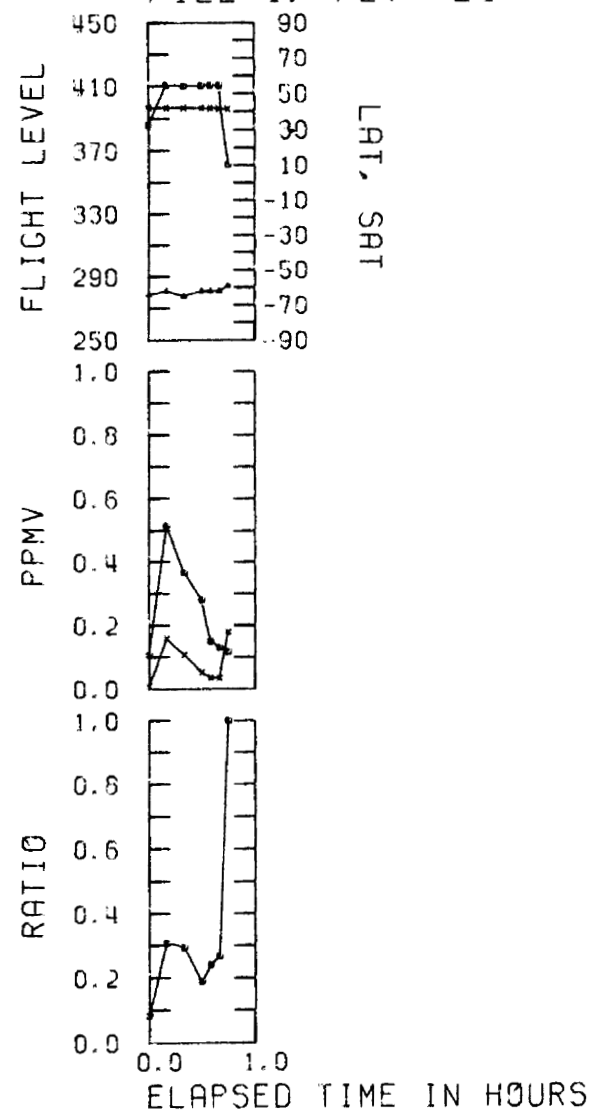


C-154

HNL TO ORD DEPARTURE 23 MAR 79
TAPE VL30, FILE 1, FLT 23

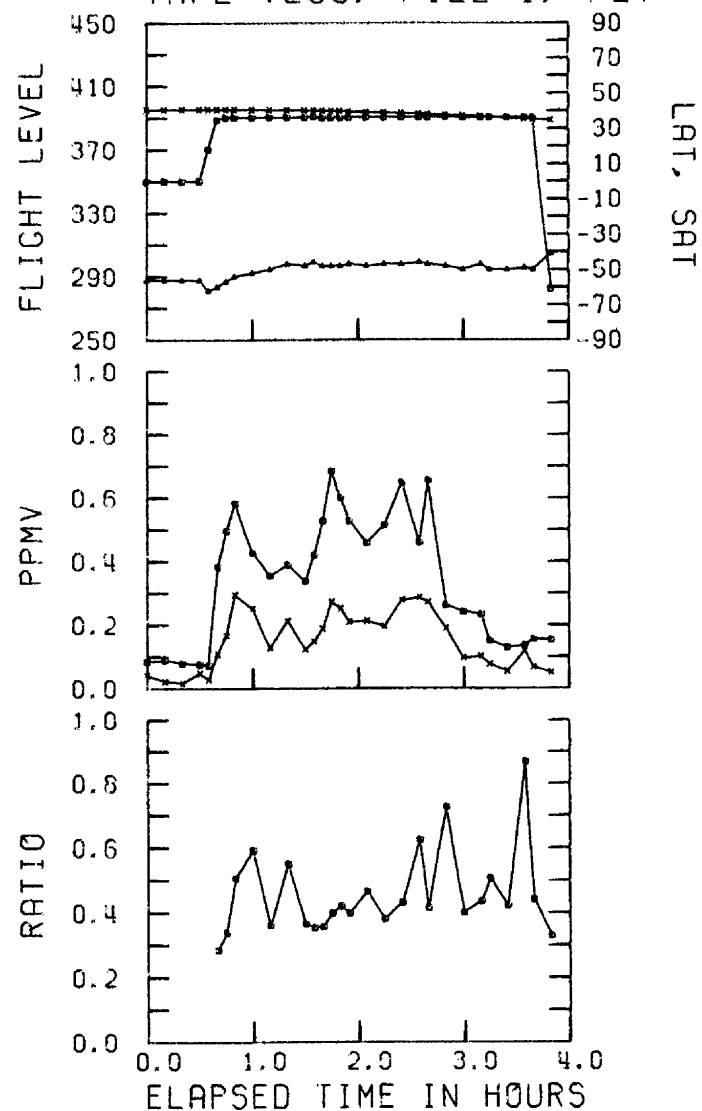


ORD TO JFK
DEPARTURE 23 MAR 79
TAPE VL30,
FILE 1, FLT 24

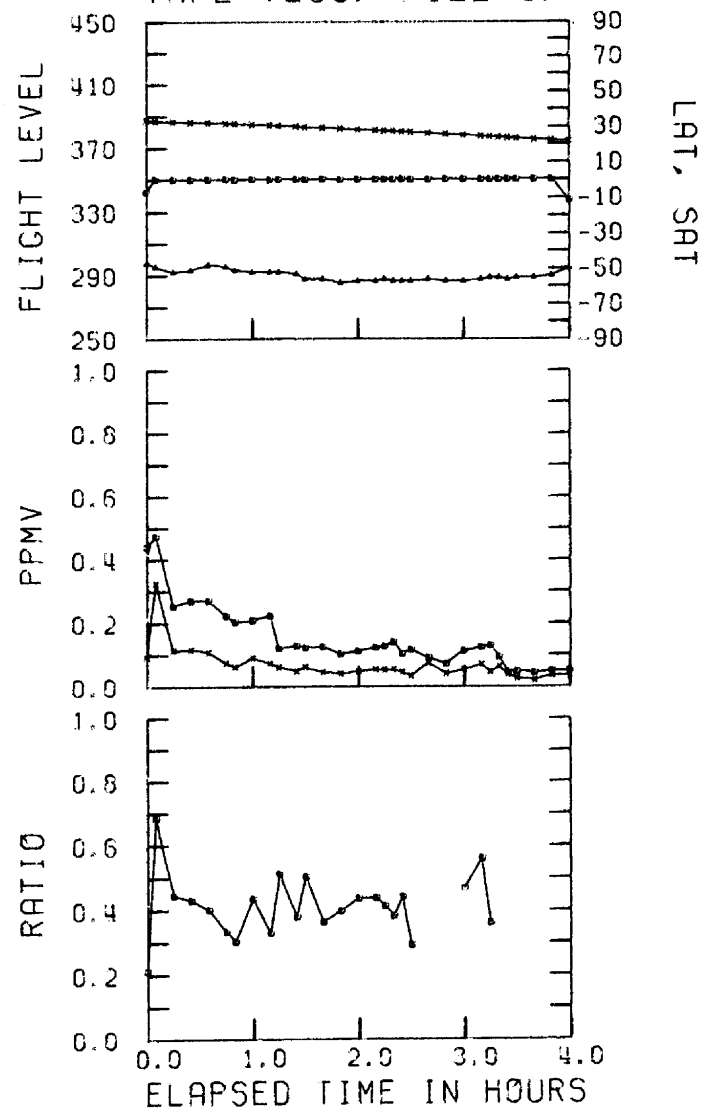


C-155

JFK TO LAX DEPARTURE 23 MAR 79
TAPE VL30, FILE 1, FLT 25

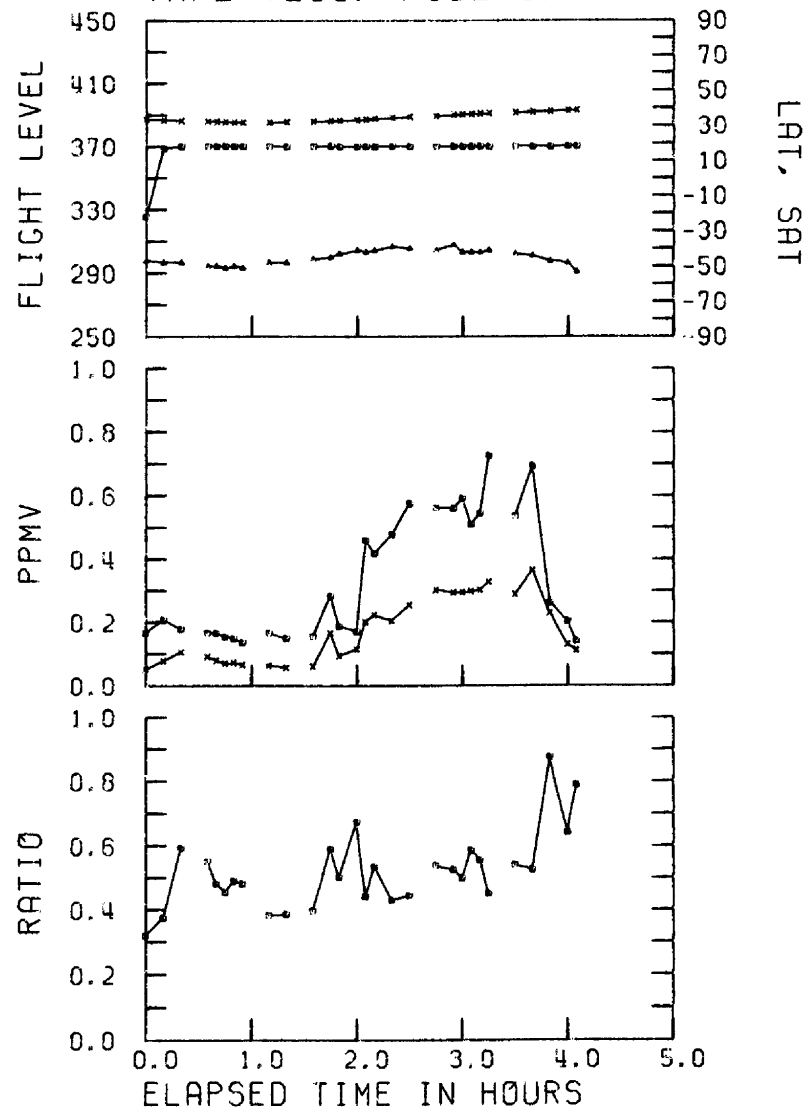


LAX TO HNL DEPARTURE 24 MAR 79
TAPE VL30, FILE 1, FLT 26

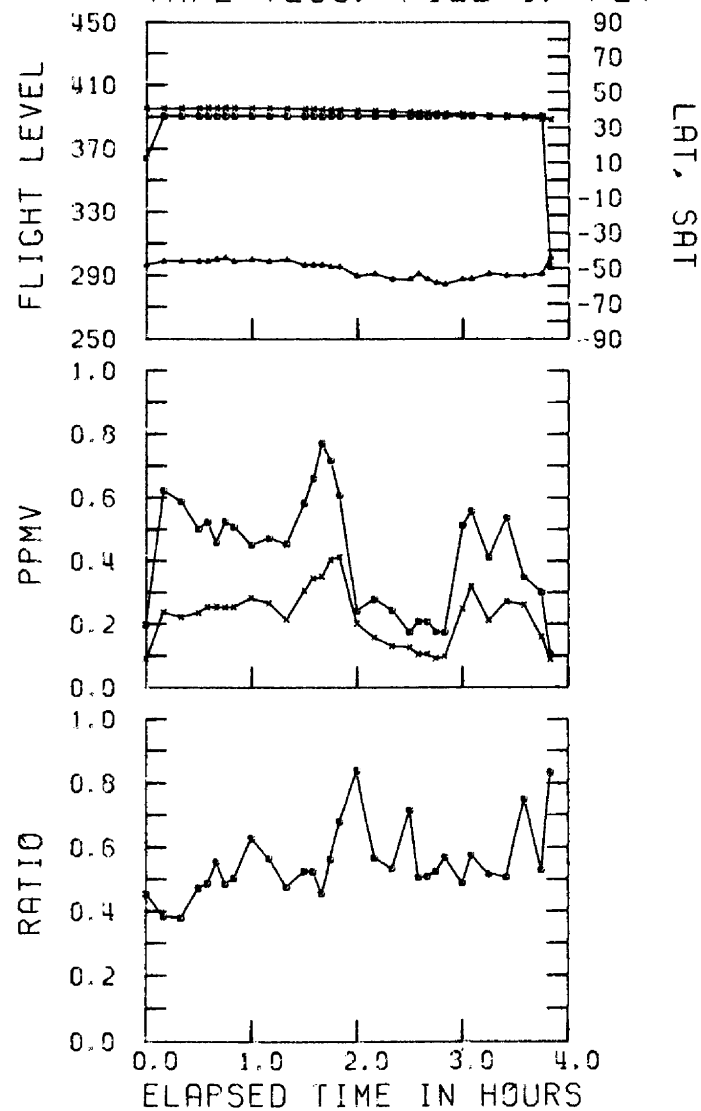


C-156

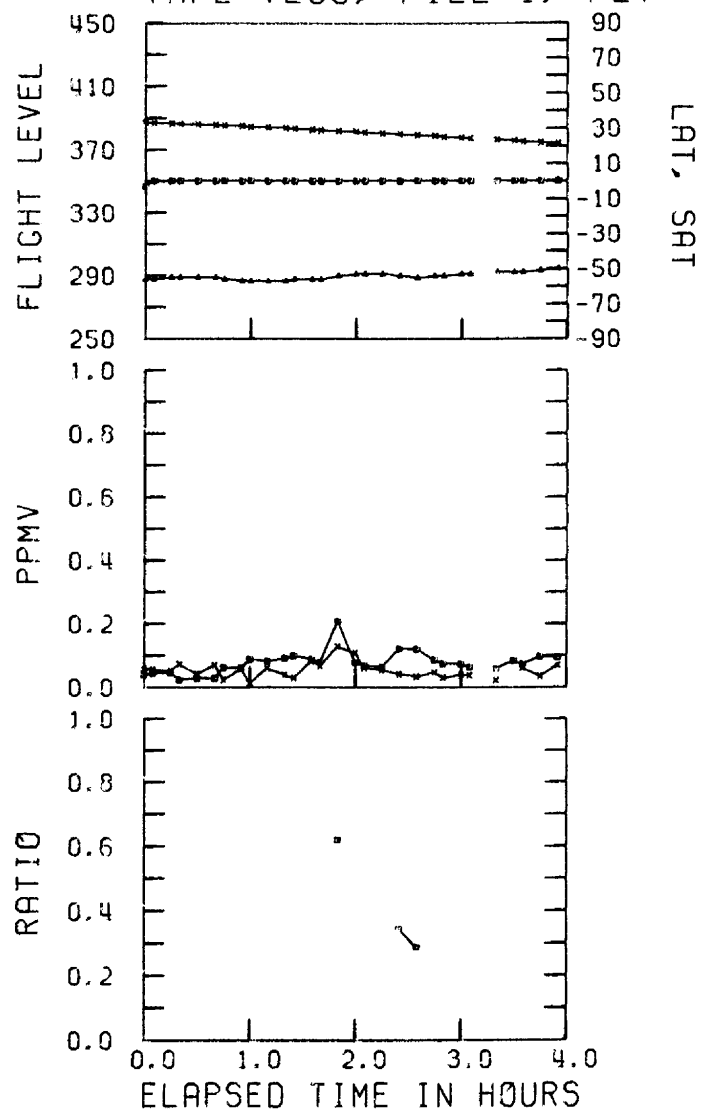
LAX TO JFK DEPARTURE 24 MAR 79
TAPE VL30, FILE 1, FLT 27



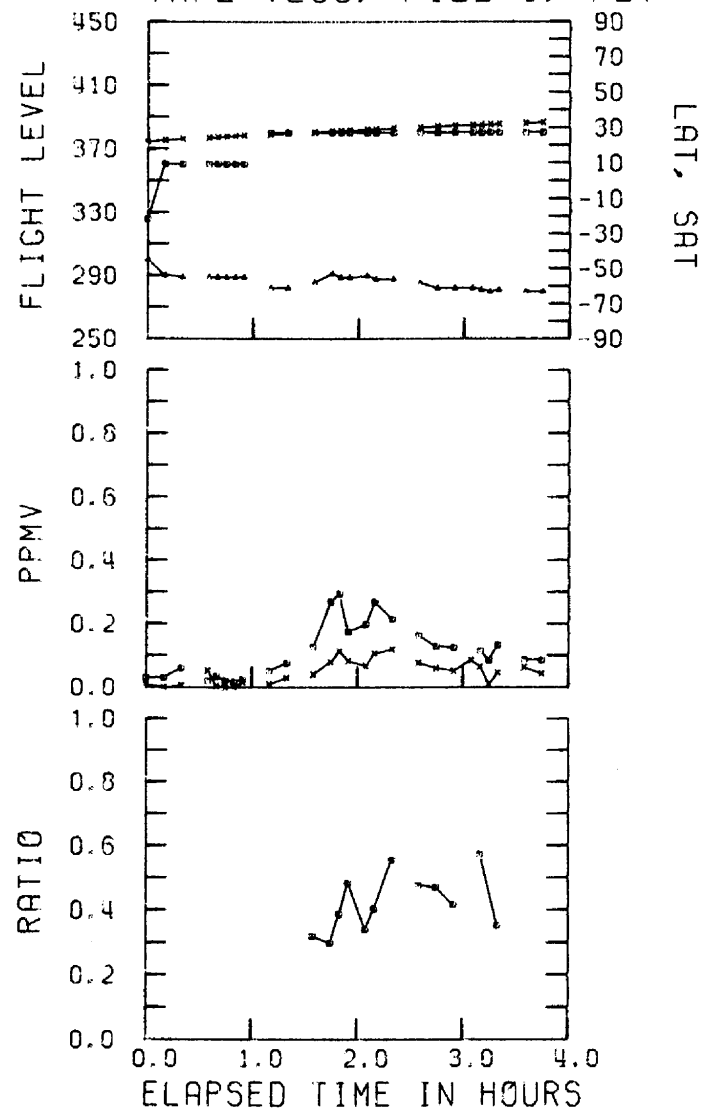
JFK TO LAX DEPARTURE 24 MAR 79
TAPE VL30, FILE 1, FLT 28



LAX TO HNL DEPARTURE 25 MAR 79
TAPE VL30, FILE 1, FLT 29

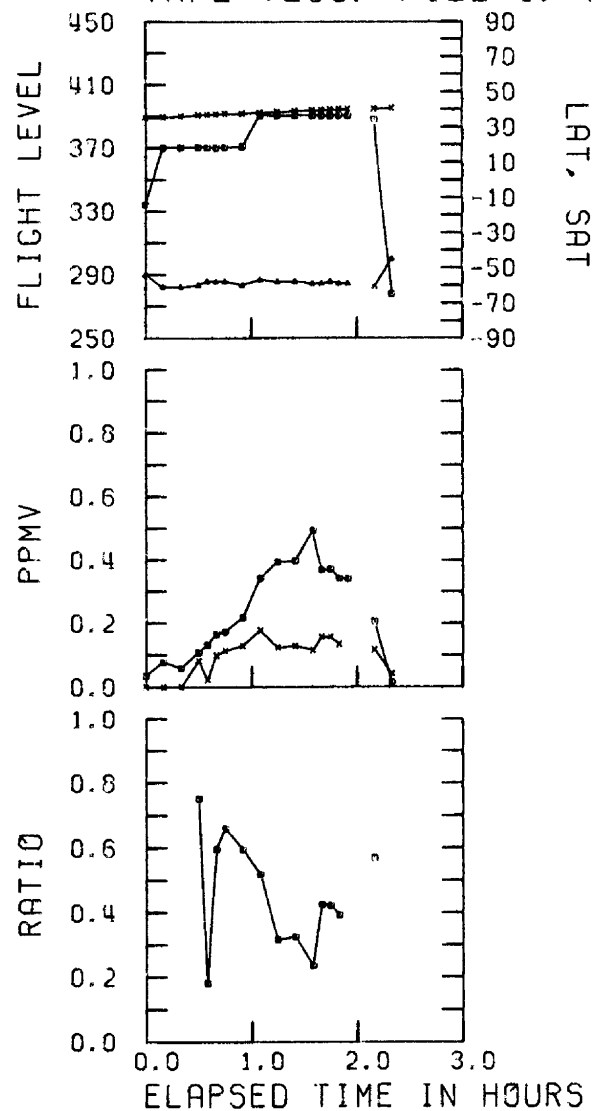


ITO TO LAX DEPARTURE 26 MAR 79
TAPE VL30, FILE 1, FLT 30

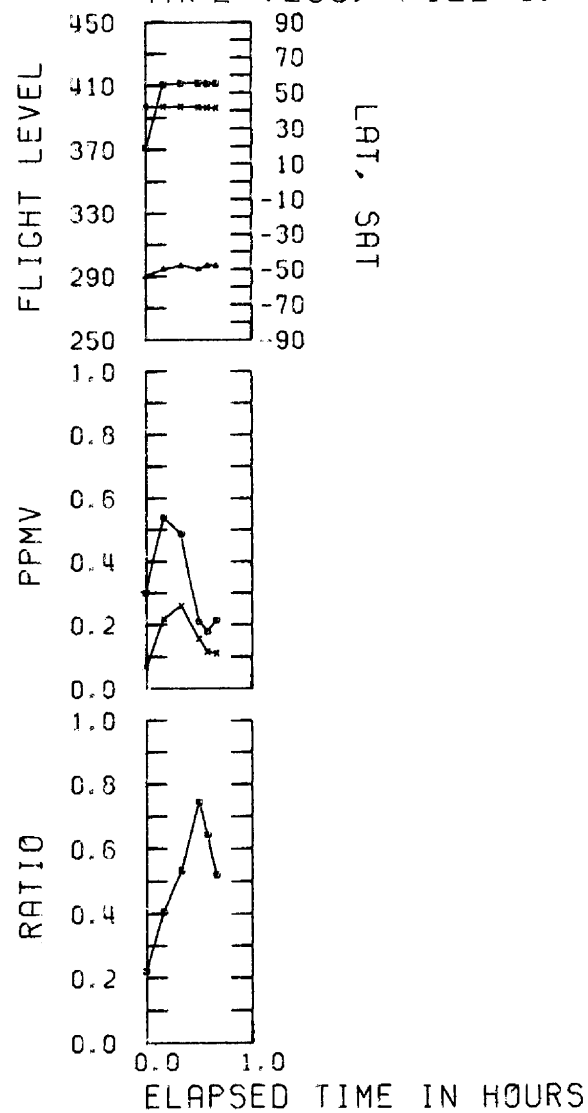


C-158

LAX TO ORD DEPARTURE 26 MAR 79
TAPE VL30, FILE 1, FLT 31

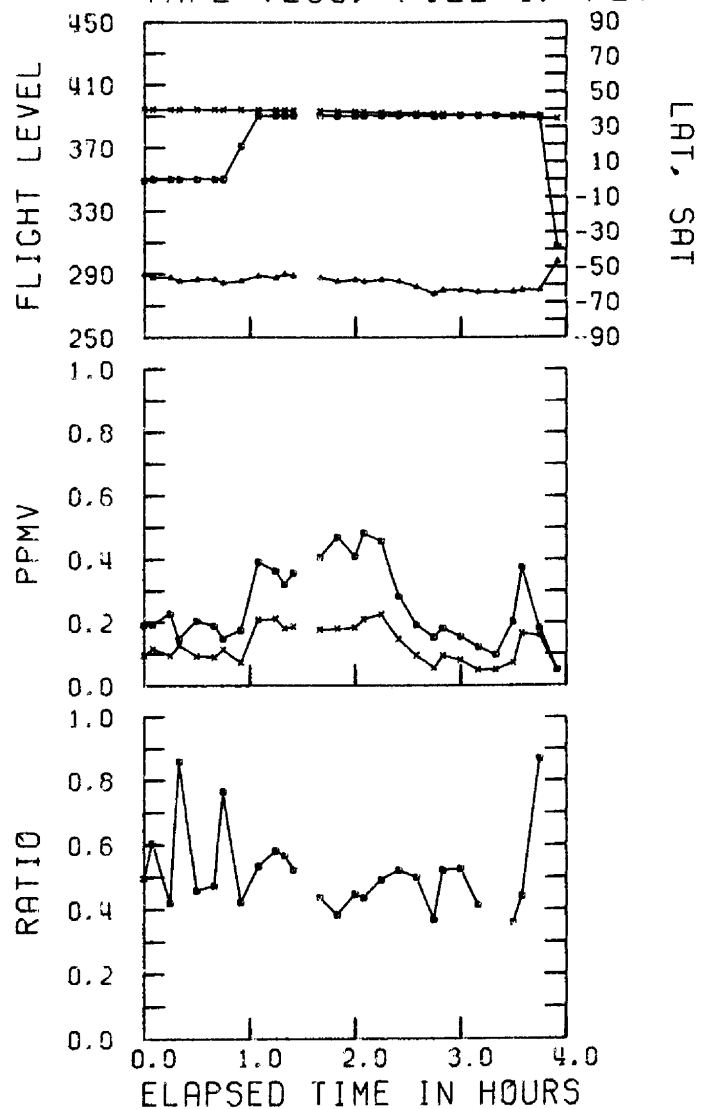


ORD TO JFK DEPARTURE 26 MAR 79
TAPE VL30, FILE 1, FLT 32

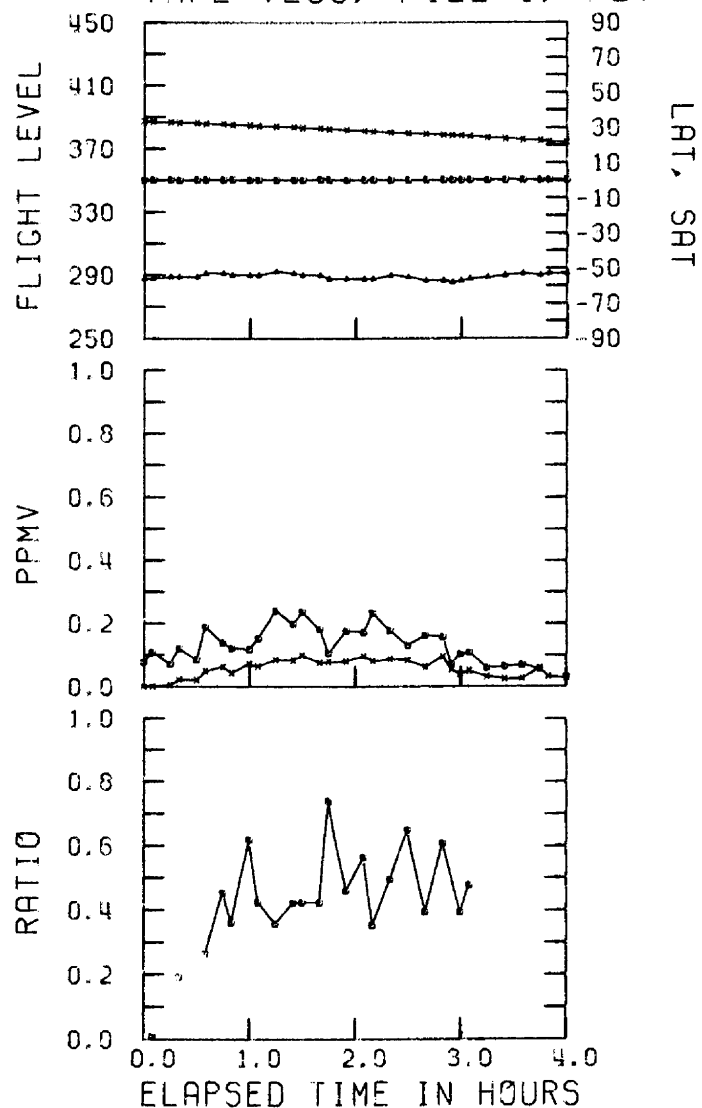


JFK TO LAX DEPARTURE 26 MAR 79
TAPE VL30, FILE 1, FLT 33

651-C

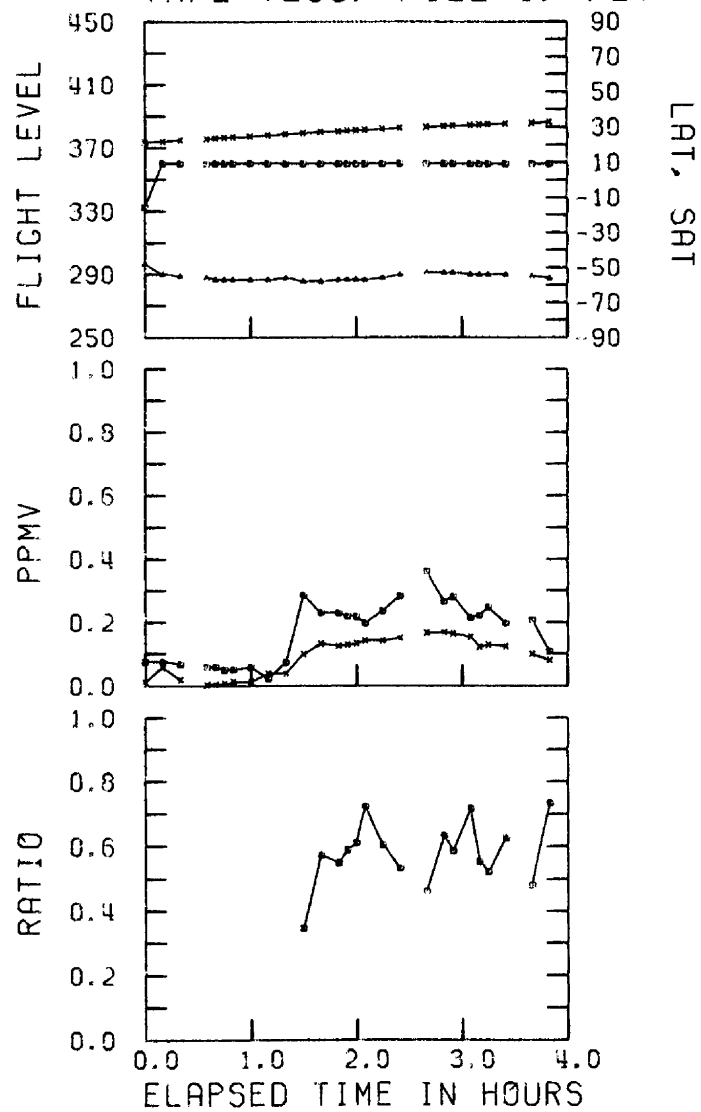


LAX TO HNL DEPARTURE 27 MAR 79
TAPE VL30, FILE 1, FLT 34

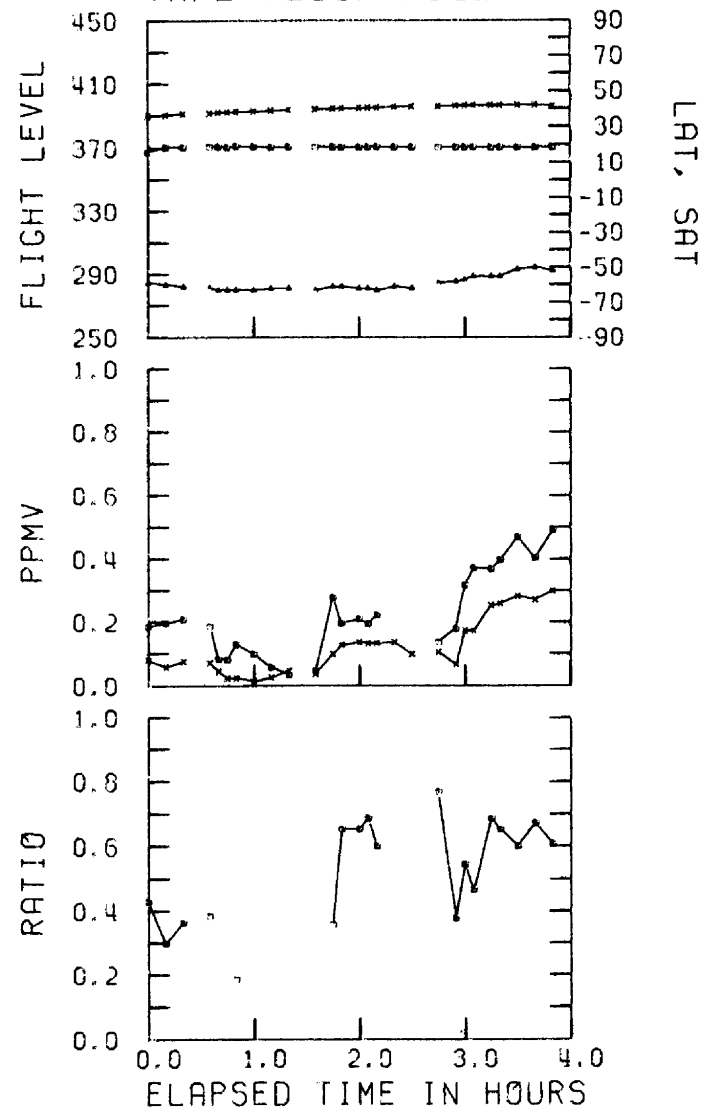


C-160

HNL TO LAX DEPARTURE 27 MAR 79
TAPE VL30, FILE 1, FLT 35

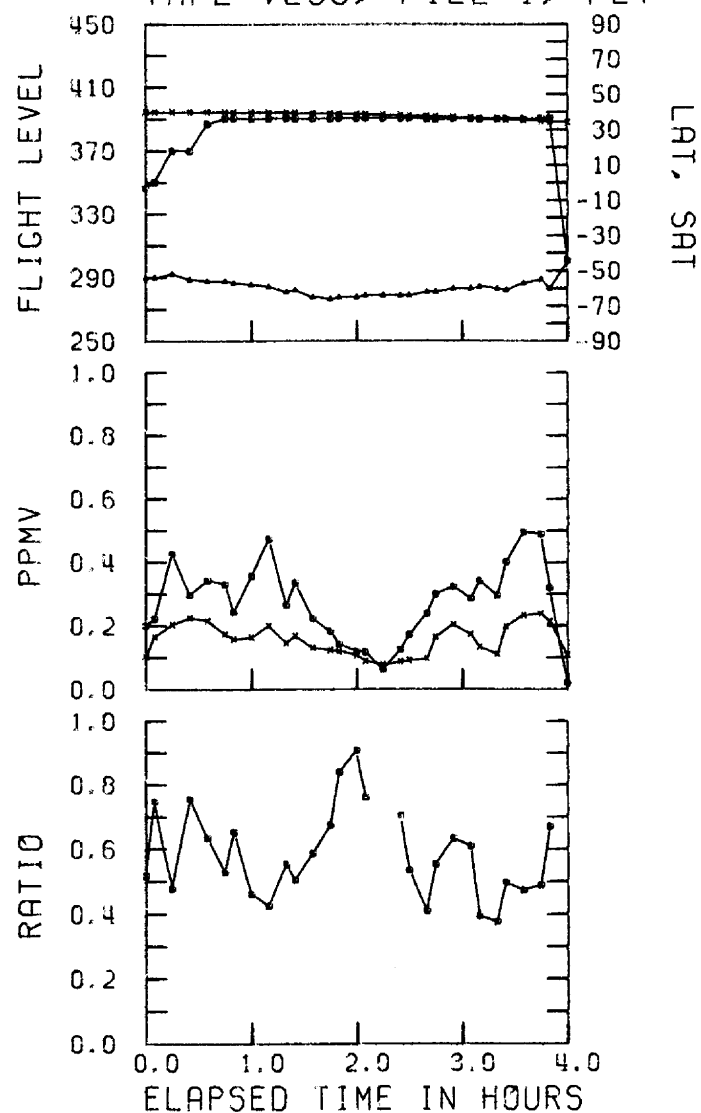


LAX TO JFK DEPARTURE 27 MAR 79
TAPE VL30, FILE 1, FLT 36

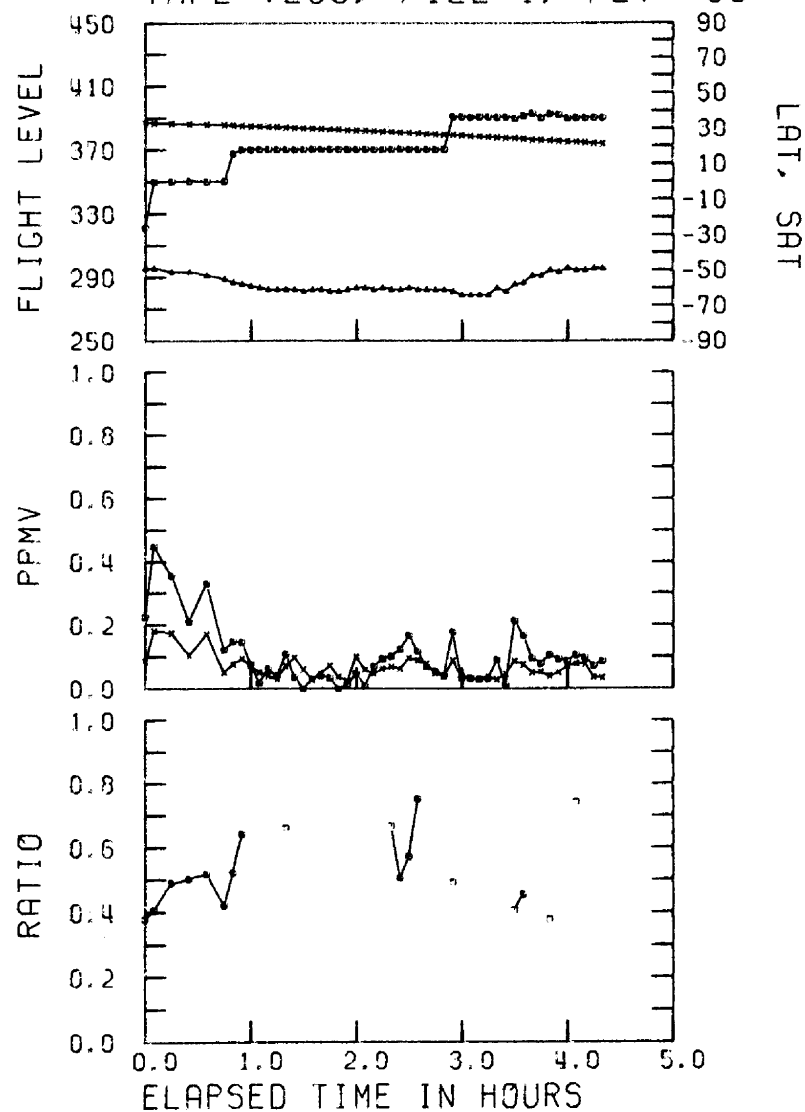


191-2

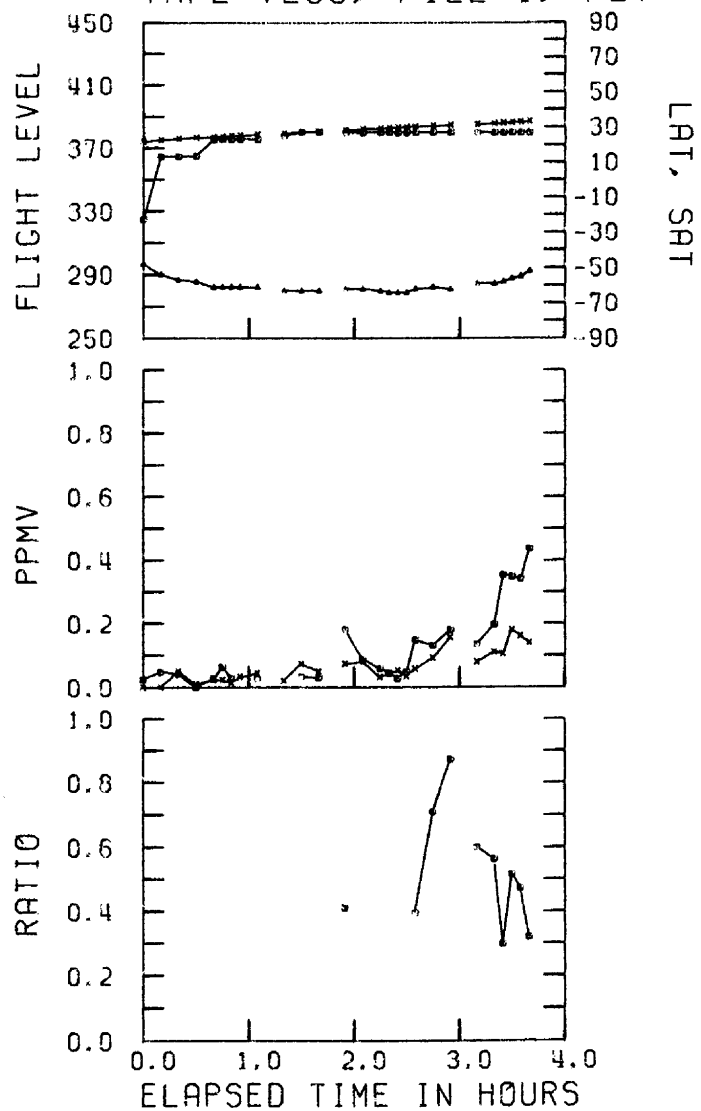
JFK TO LAX DEPARTURE 28 MAR 79
TAPE VL30, FILE 1, FLT 37



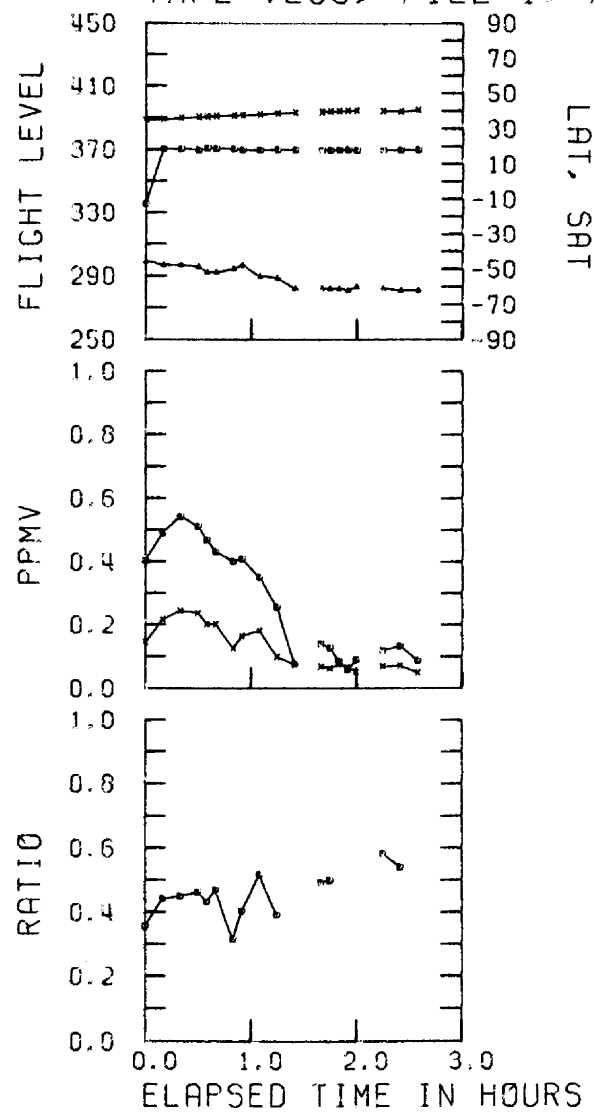
LAX TO HNL DEPARTURE 28 MAR 79
TAPE VL30, FILE 1, FLT 38



ITO TO LAX DEPARTURE 29 MAR 79
TAPE VL30, FILE 1, FLT 40

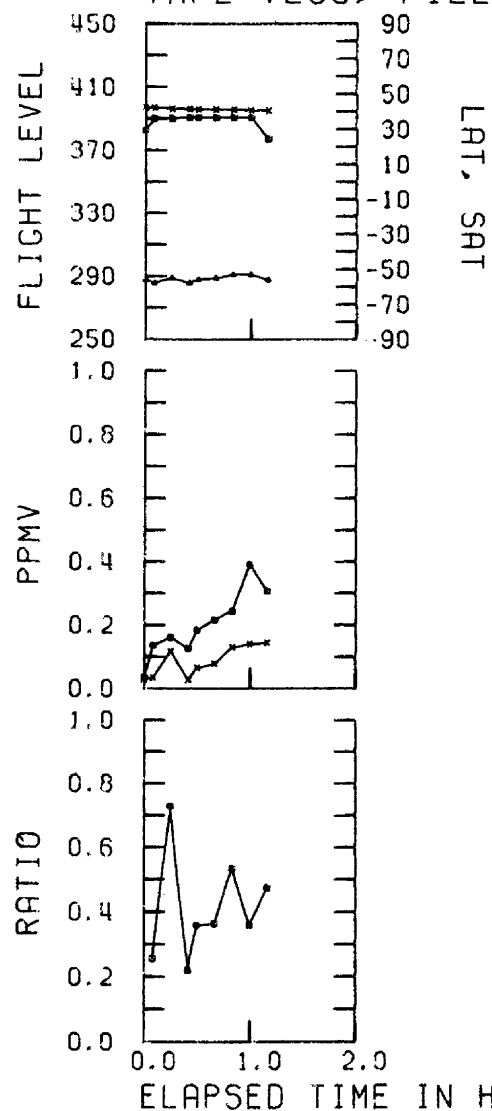


LAX TO ORD DEPARTURE 29 MAR 79
TAPE VL30, FILE 1, FLT 41

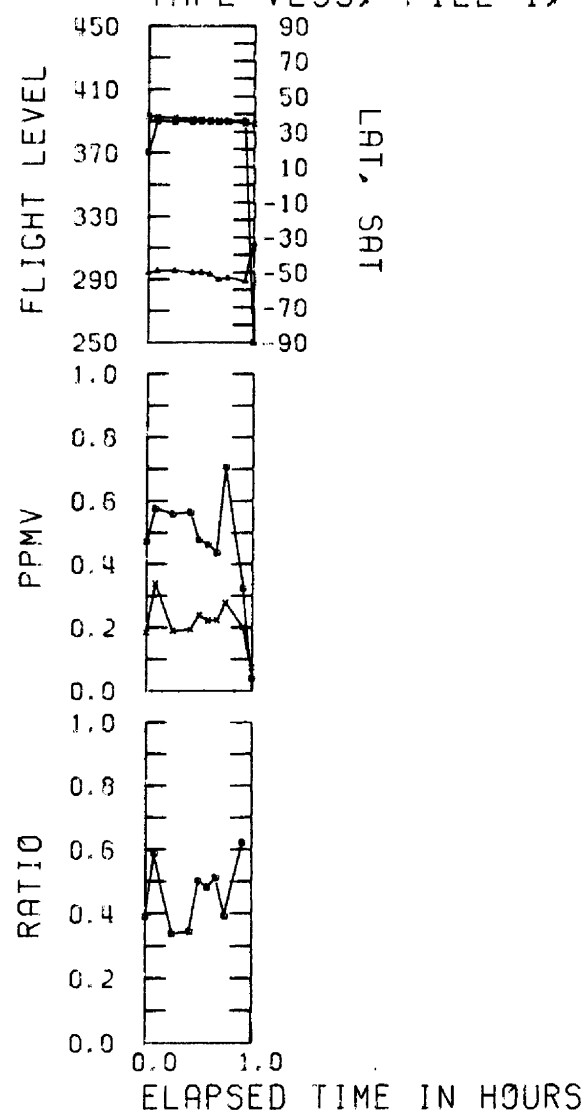


C-163

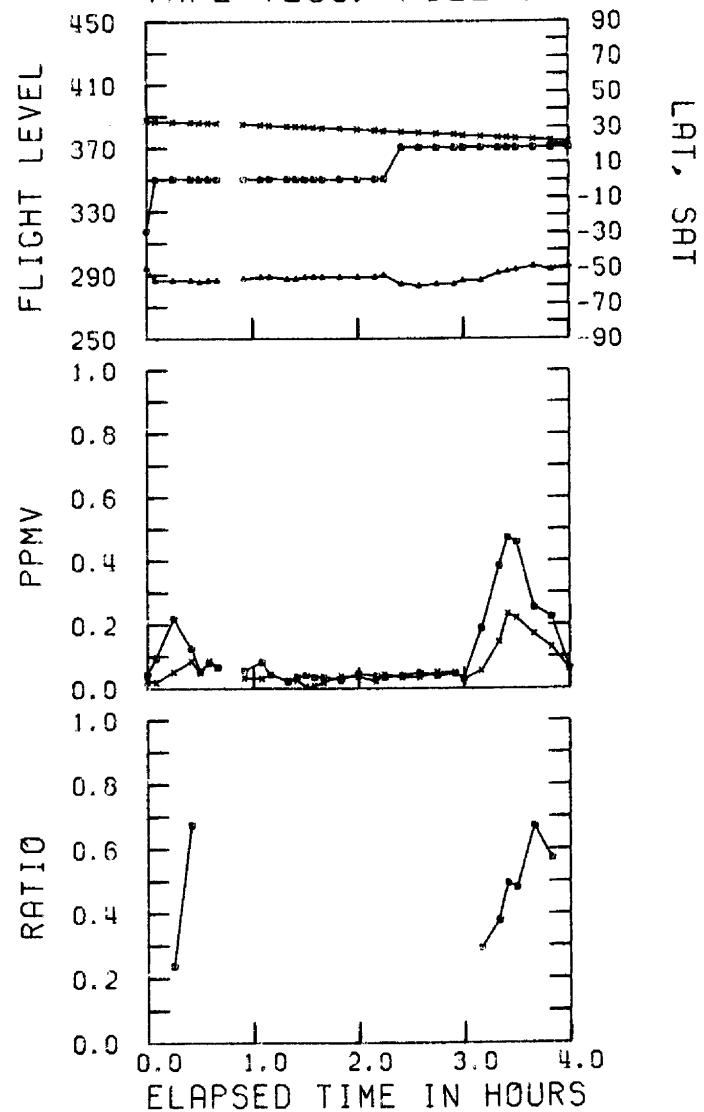
ORD TO DEN DEPARTURE 29 MAR 79
TAPE VL30, FILE 1, FLT 42



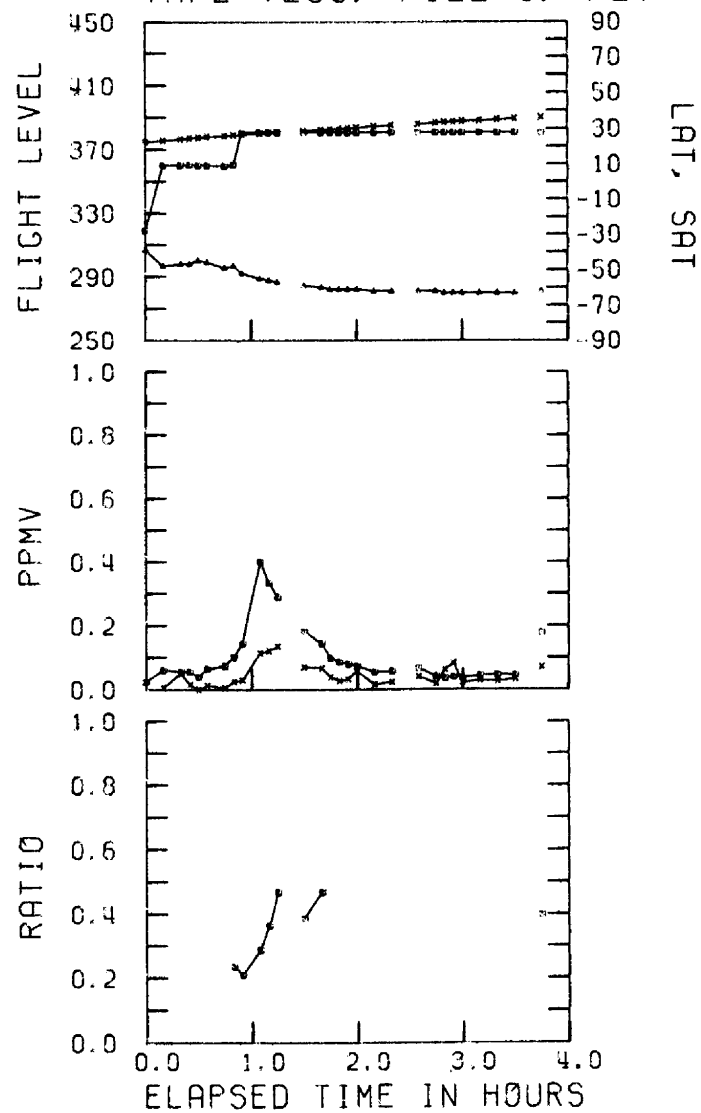
DEN TO LAX
DEPARTURE 29 MAR 79
TAPE VL30, FILE 1, FLT 43



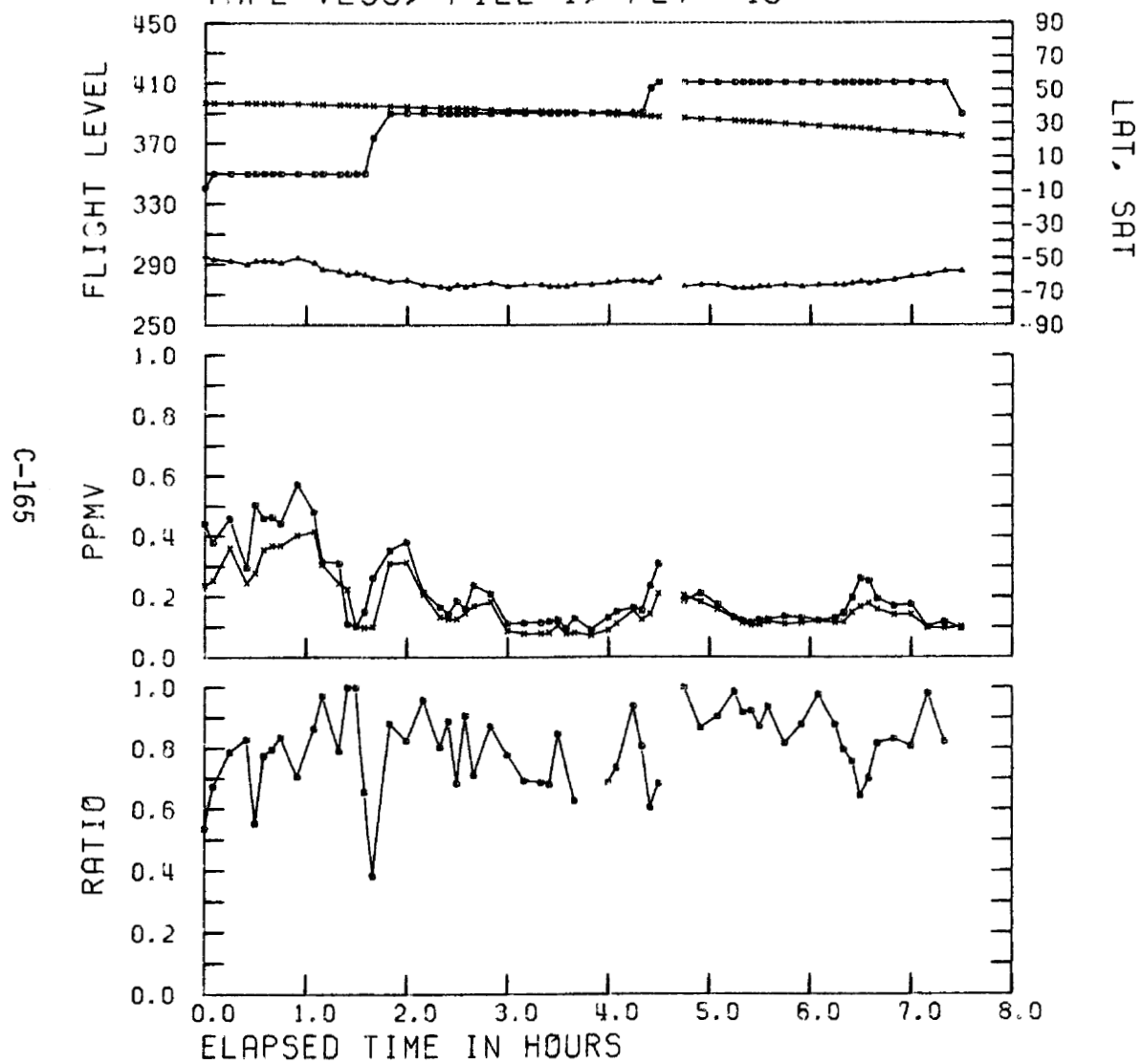
LAX TO HNL DEPARTURE 29 MAR 79
TAPE VL30, FILE 1, FLT 44



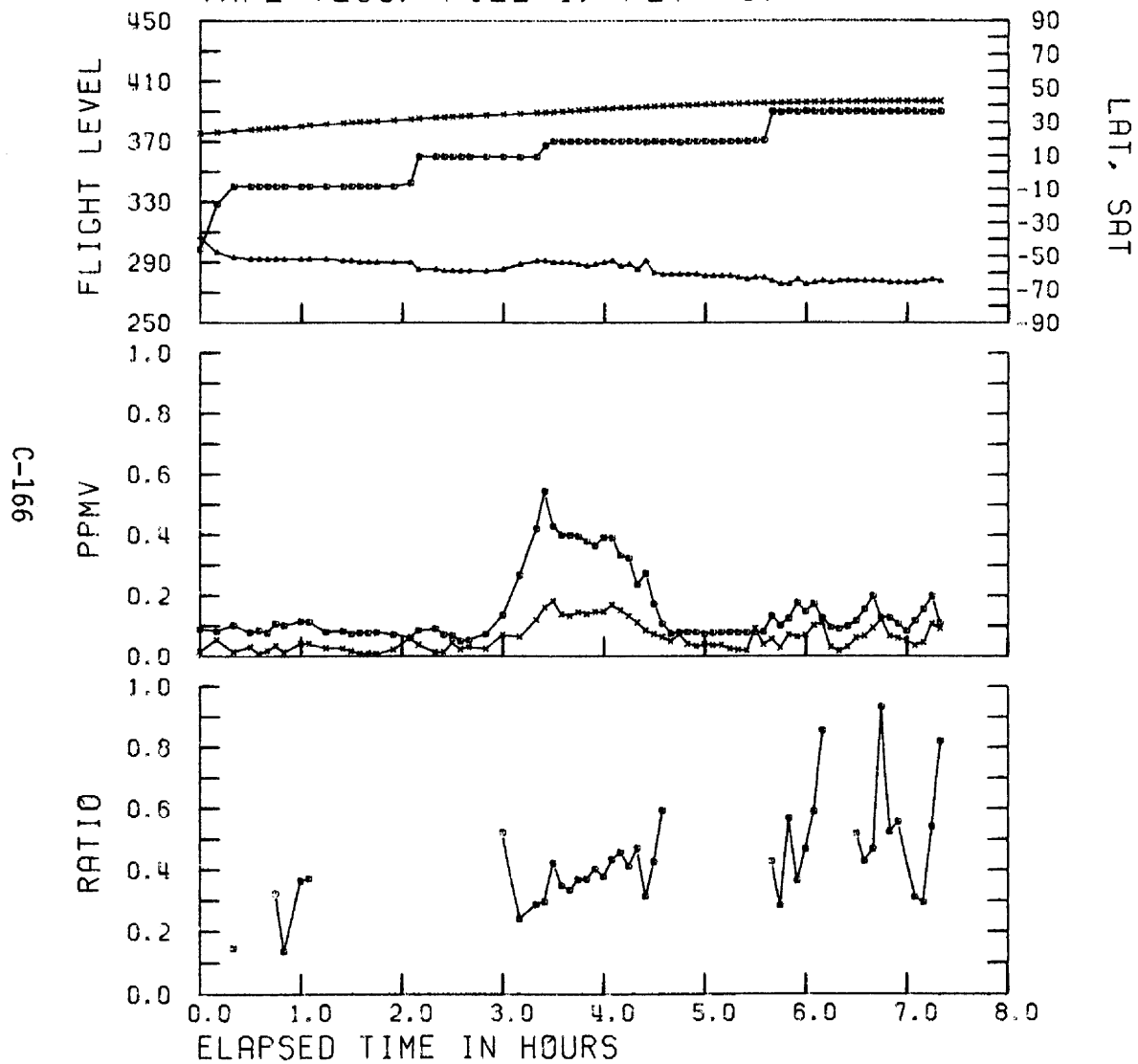
HNL TO SFO DEPARTURE 30 MAR 79
TAPE VL30, FILE 1, FLT 45



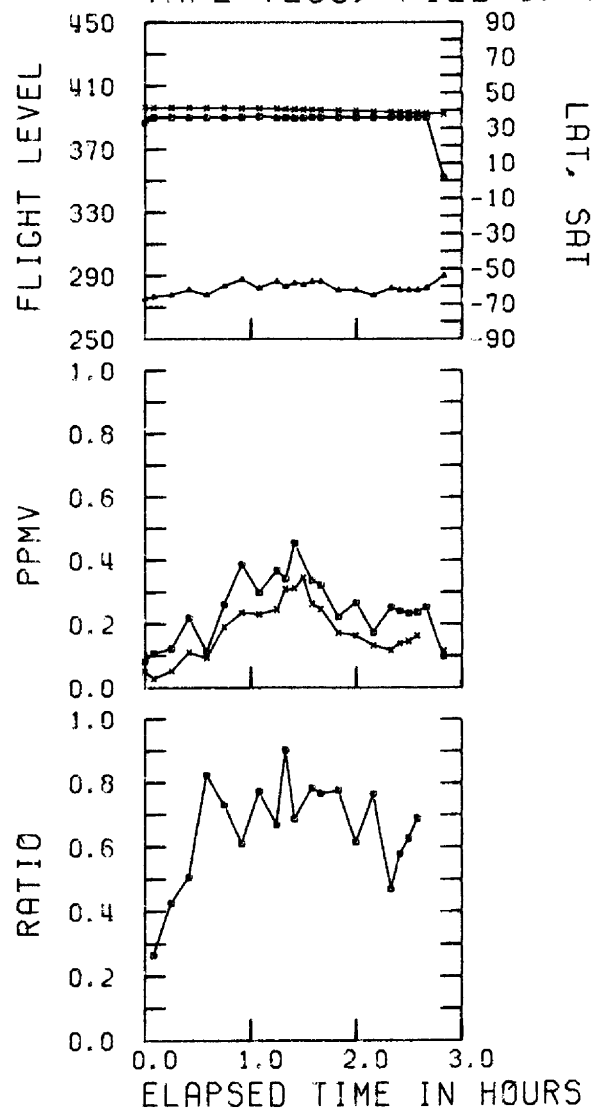
ORD TO HNL DEPARTURE 4 APR 79
TAPE VL30, FILE 1, FLT 46



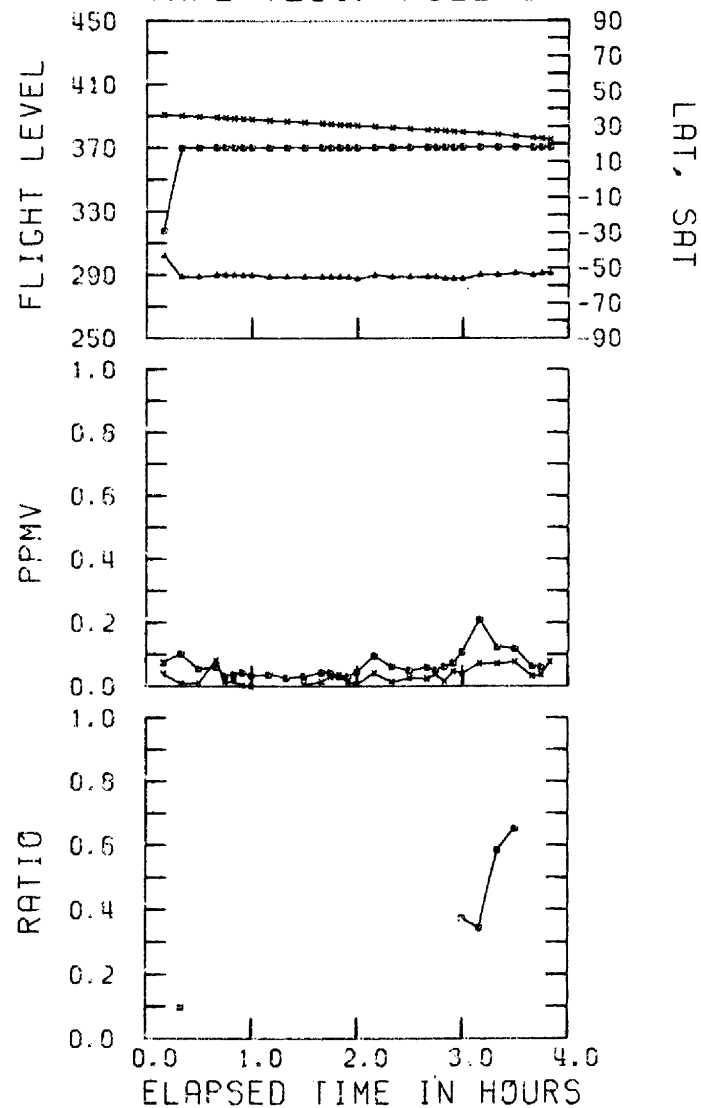
HNL TO ORD DEPARTURE 6 APR 79
TAPE VL30, FILE 1, FLT 47



ORD TO SFO DEPARTURE 7 APR 79
TAPE VL30, FILE 1, FLT 48

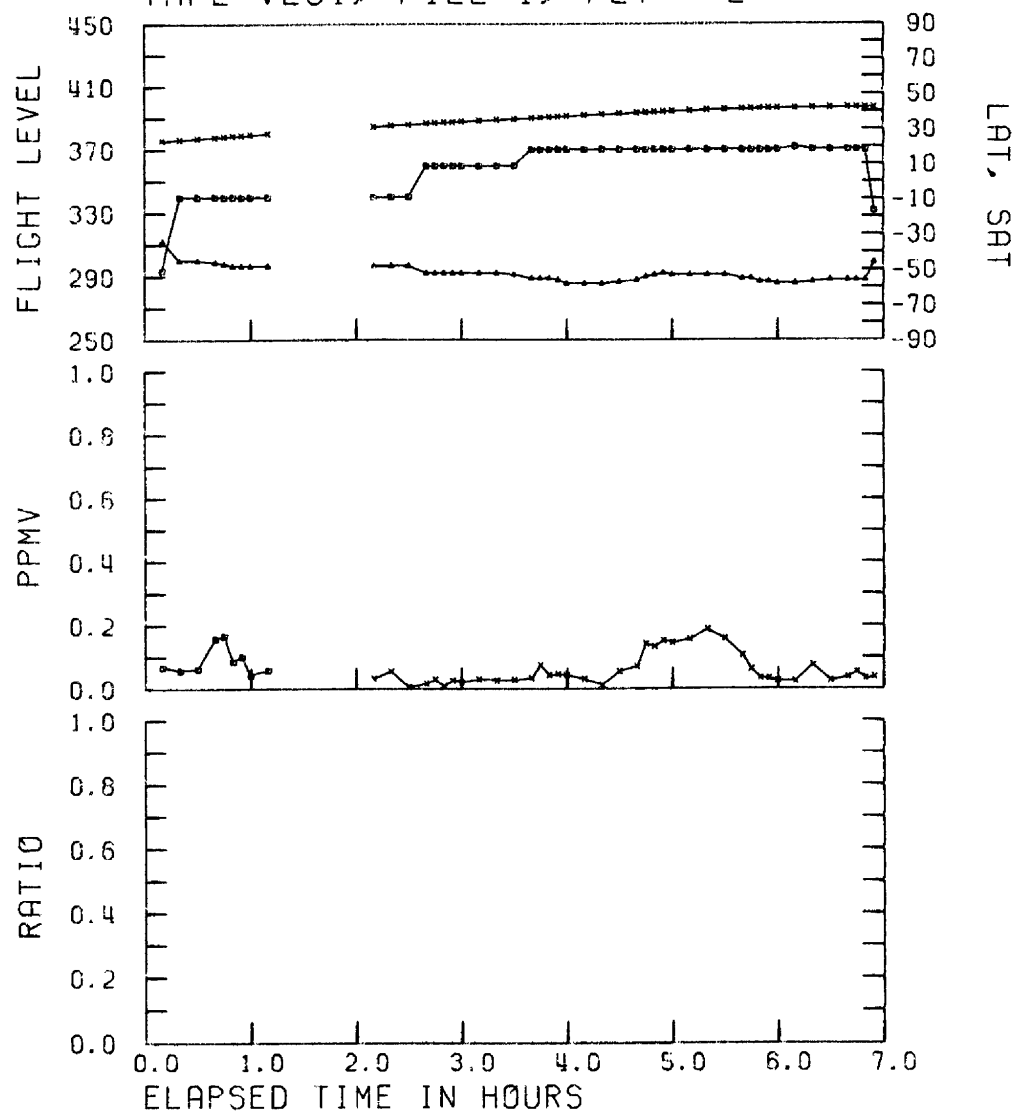


SFO TO HNL DEPARTURE 29 MAY 79
TAPE VL31, FILE 1, FLT 1



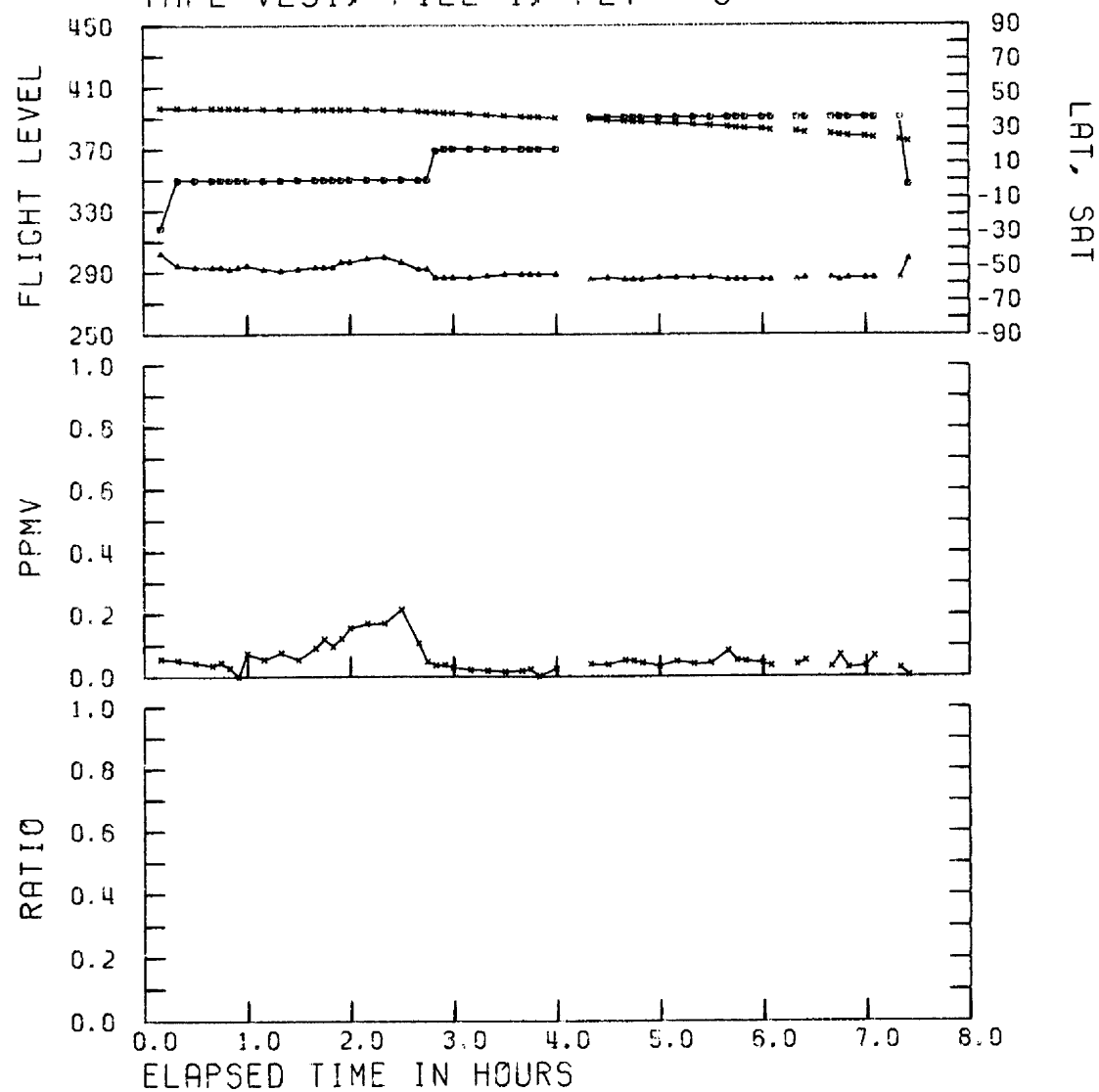
C-167

HNL TO ORD DEPARTURE 30 MAY 79
TAPE VL31, FILE 1, FLT 2

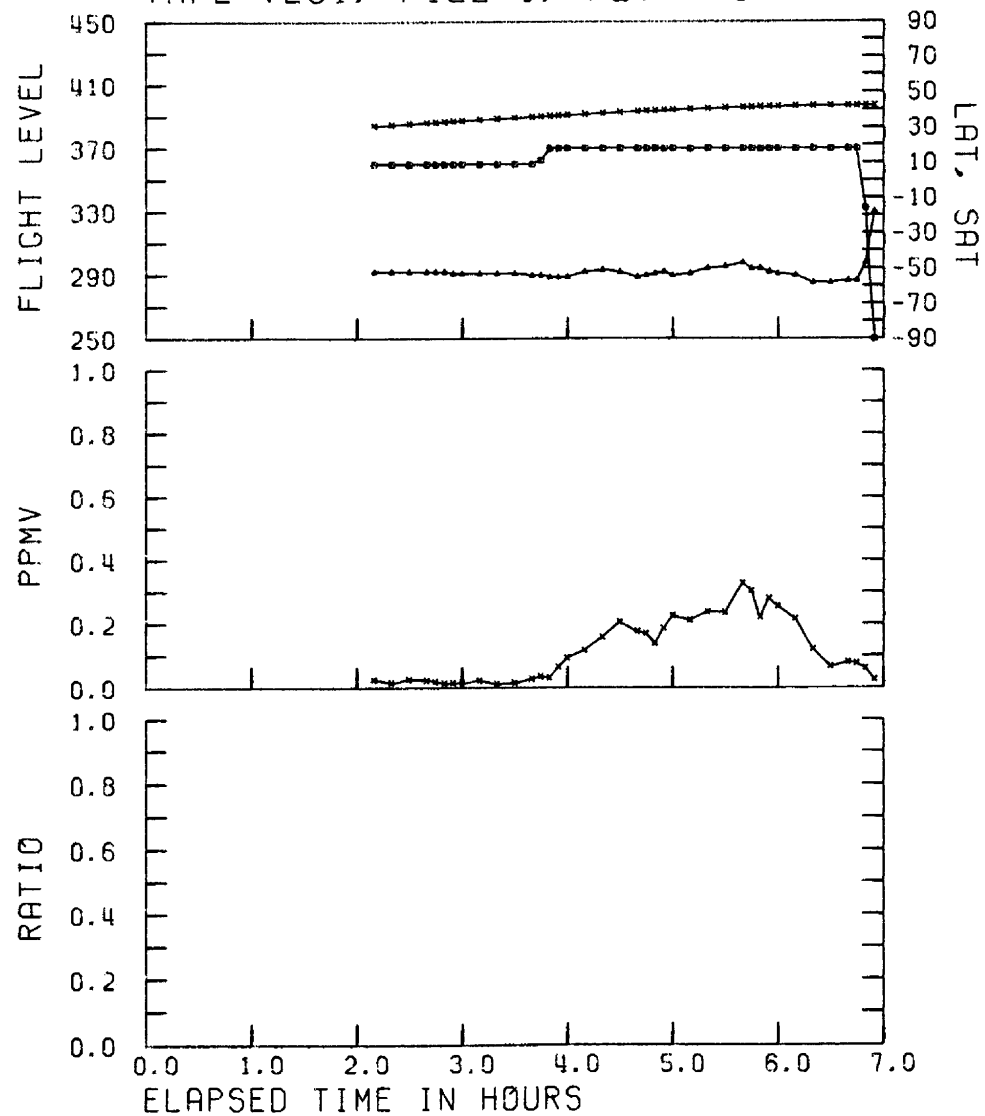


ORD TO HNL DEPARTURE 30 MAY 79
 TAPE VL31, FILE 1, FLT 3

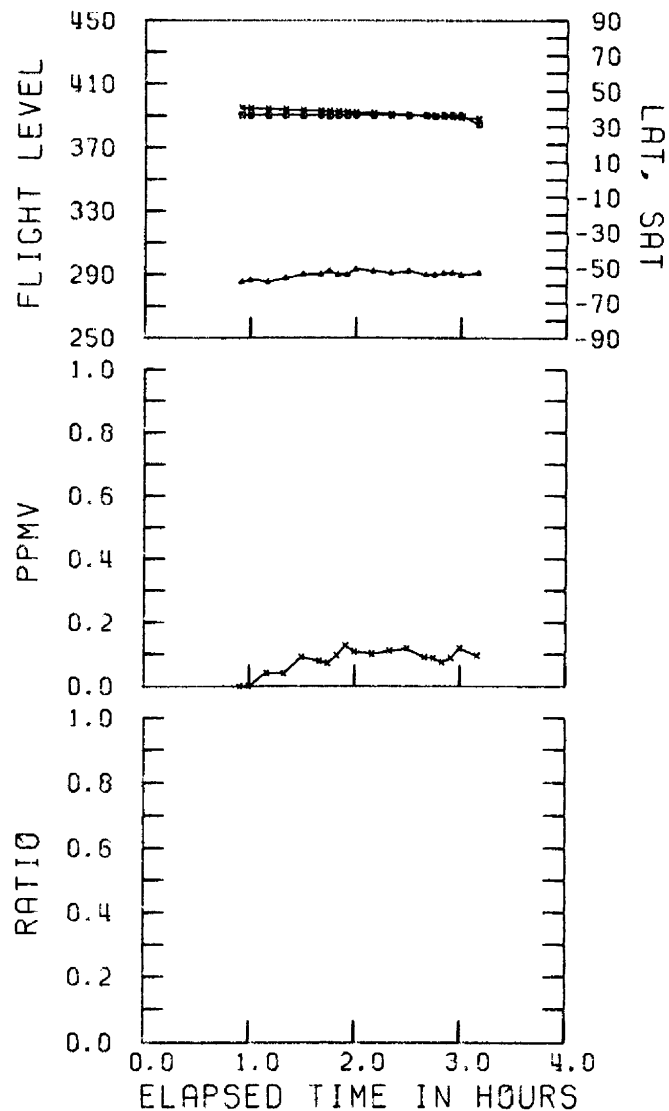
69I-C



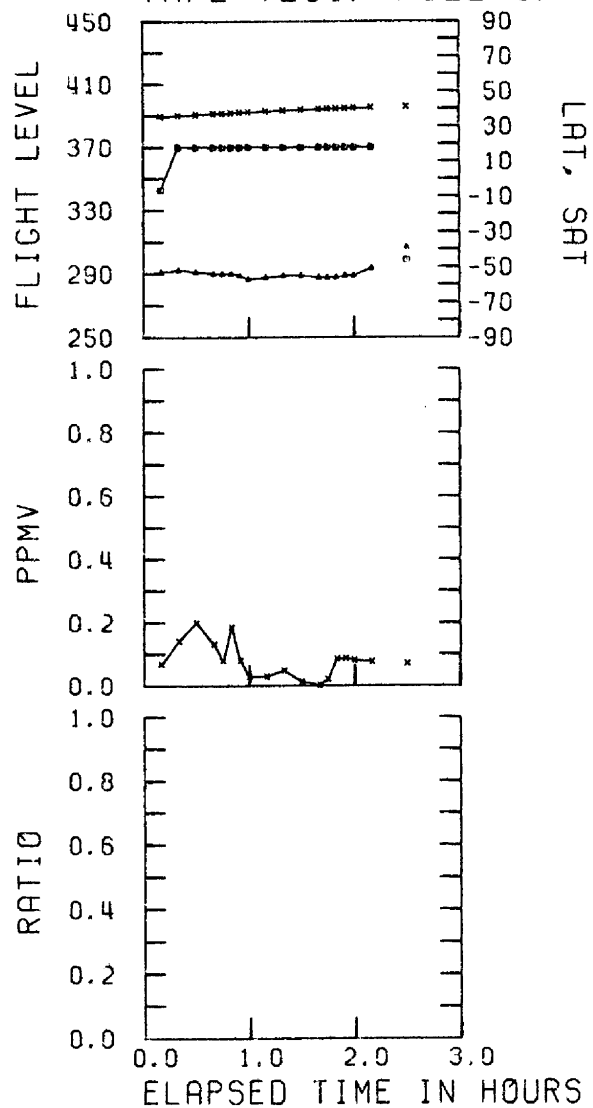
HNL TO ORD DEPARTURE 31 MAY 79
TAPE VL31, FILE 1, FLT 4



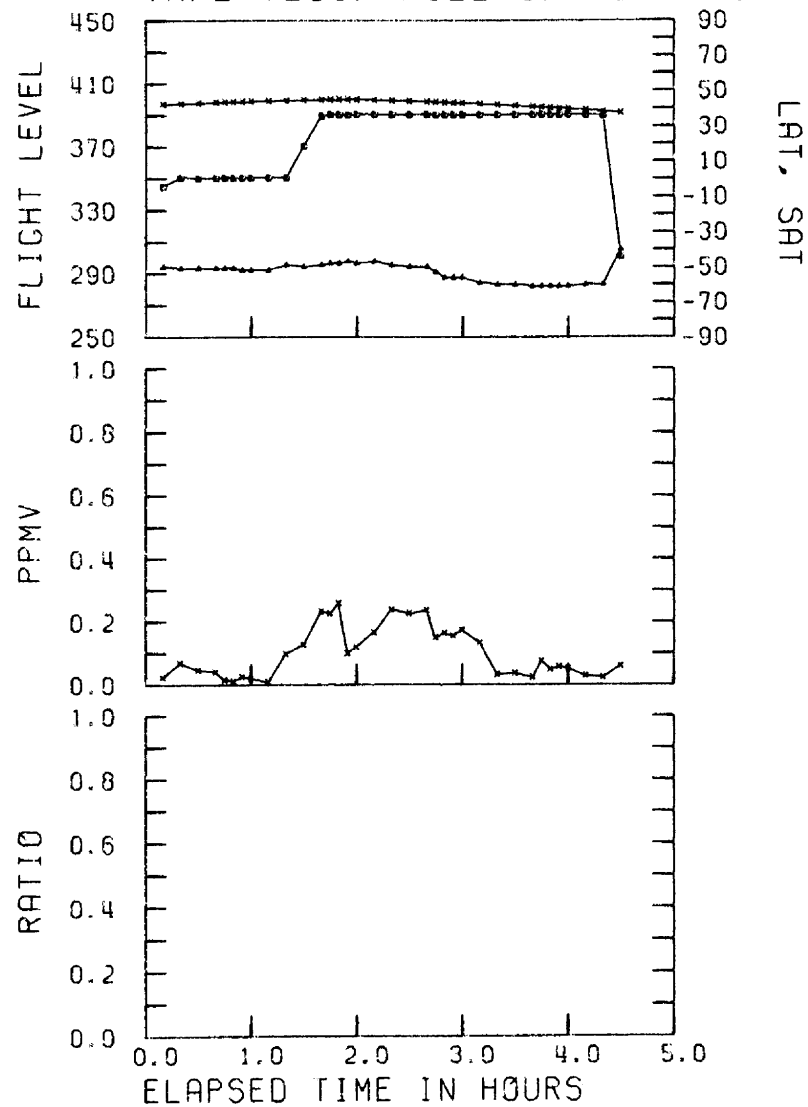
ORD TO LAX
DEPARTURE 31 MAY 79
TAPE VL31,
FILE 1, FLT 5



LAX TO ORD DEPARTURE 1 JUN 79
TAPE VL31, FILE 1, FLT 6

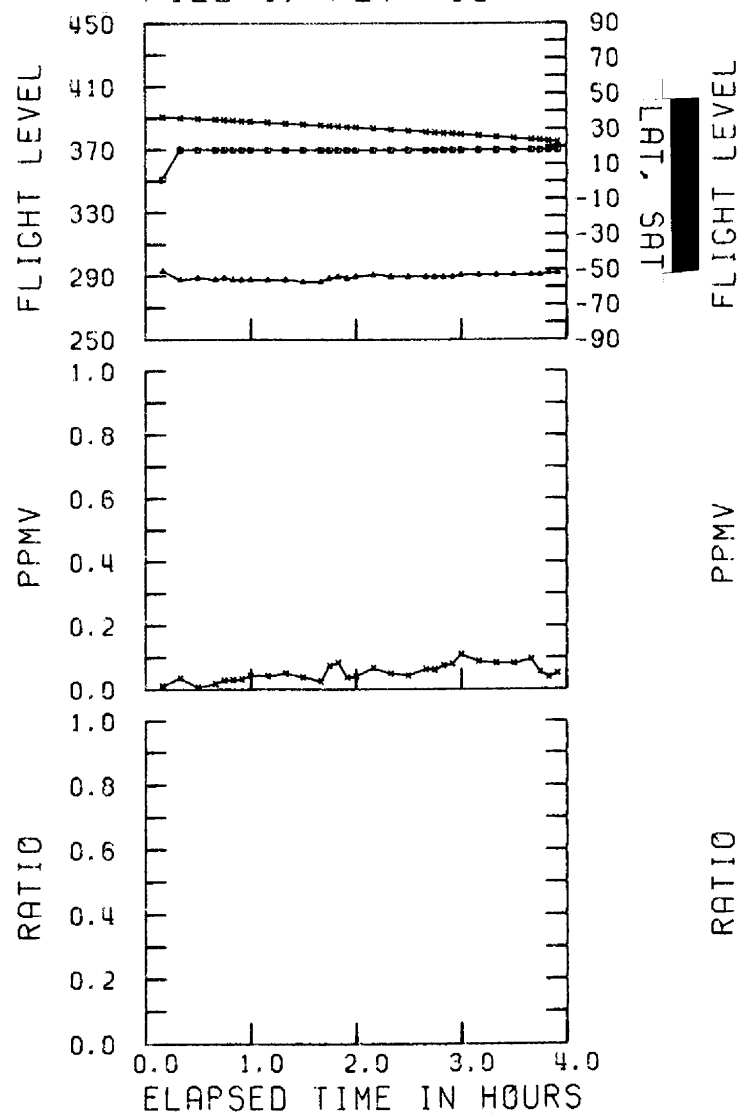


JFK TO SFO DEPARTURE 2 JUN 79
TAPE VL31, FILE 1, FLT 9

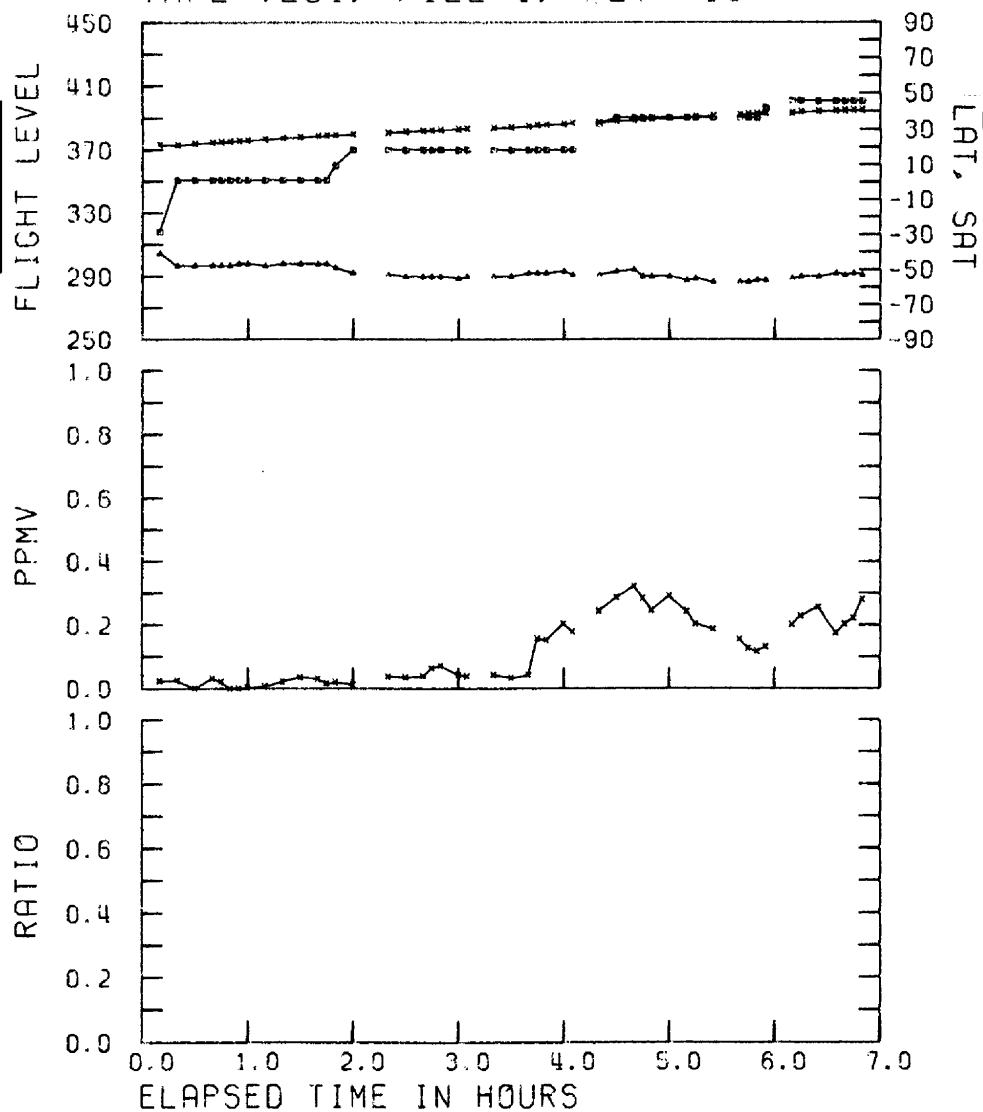


C-171

SFO TO HNL
DEPARTURE 2 JUN 79
TAPE VL31,
FILE 1, FLT 10

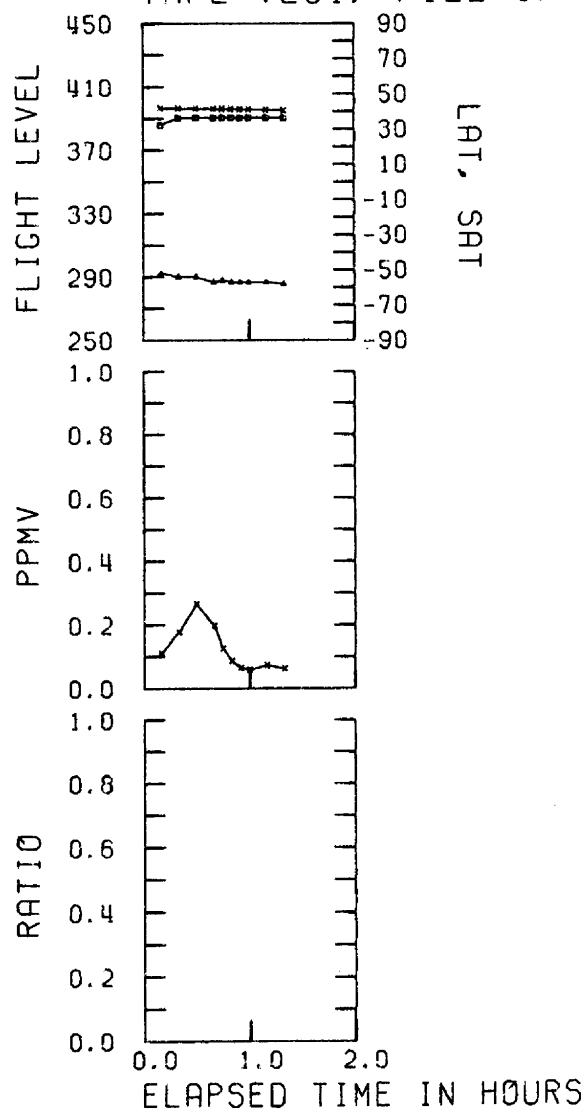


HNL TO ORD DEPARTURE 3 JUN 79
TAPE VL31, FILE 1, FLT 11

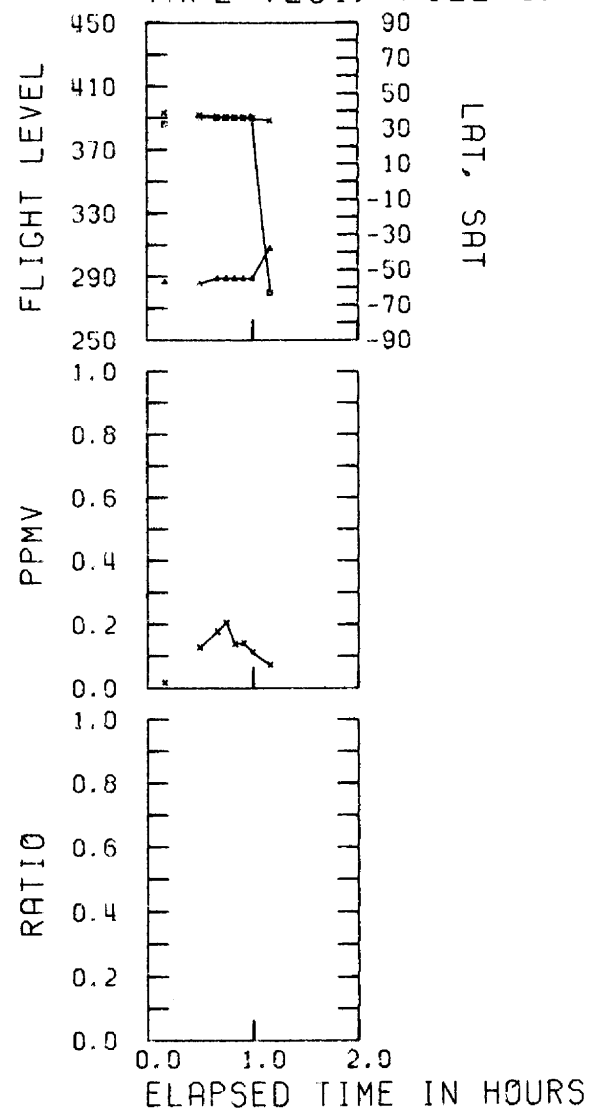


C-173

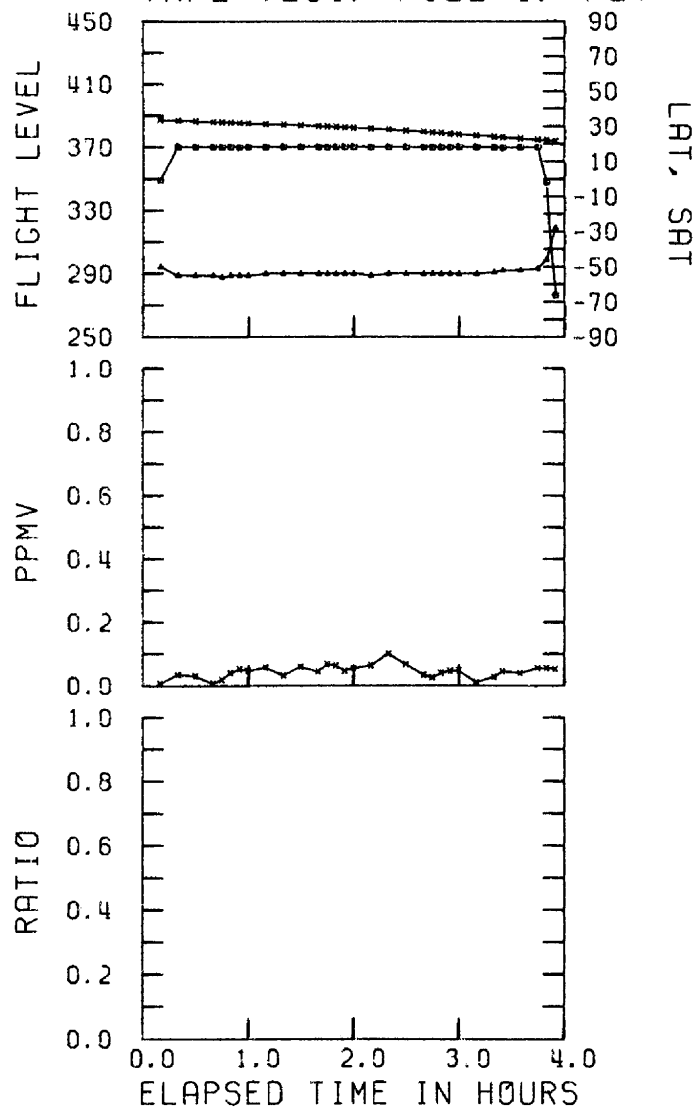
ORD TO DEN DEPARTURE 3 JUN 79
TAPE VL31, FILE 1, FLT 12



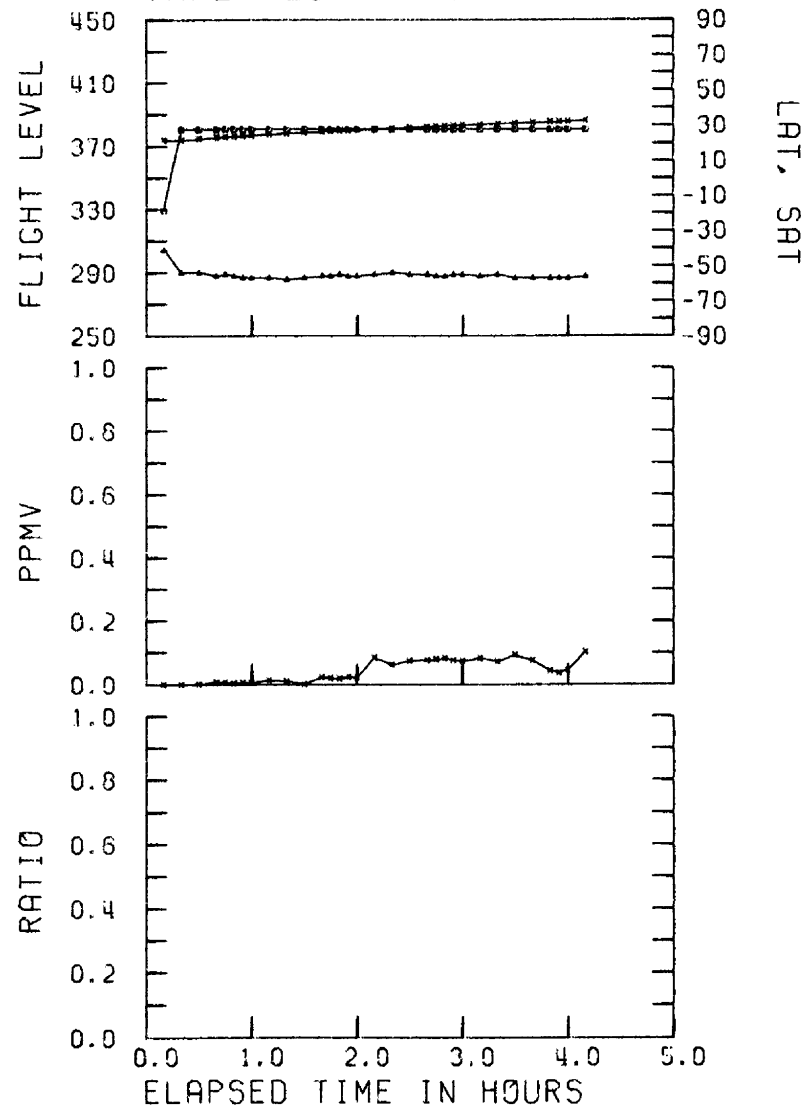
DEN TO LAX DEPARTURE 3 JUN 79
TAPE VL31, FILE 1, FLT 13



LAX TO HNL DEPARTURE 3 JUN 79
TAPE VL31, FILE 1, FLT 14

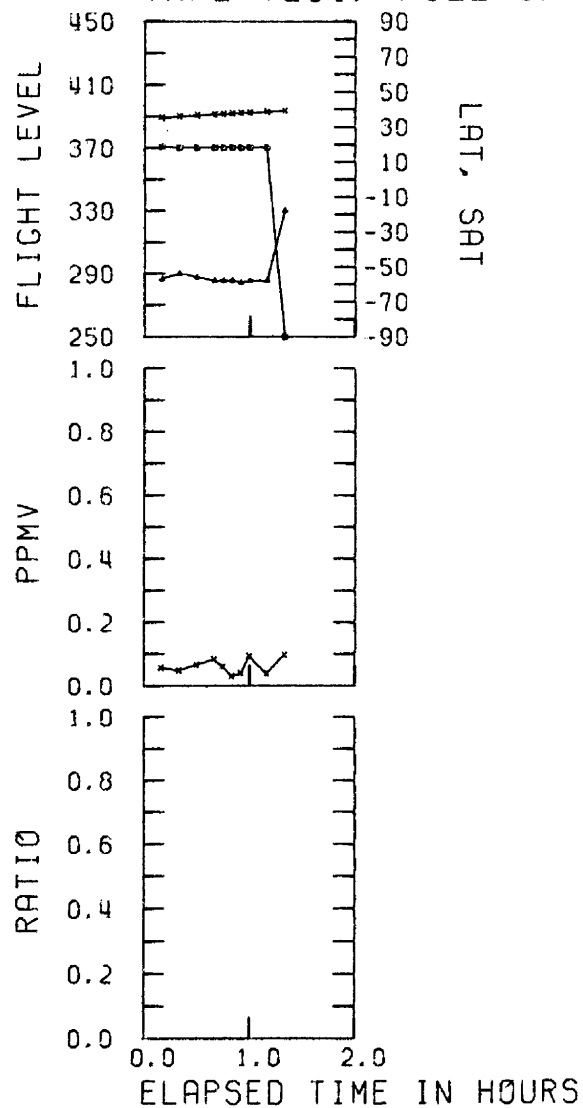


HNL TO LAX DEPARTURE 4 JUN 79
TAPE VL31, FILE 1, FLT 15

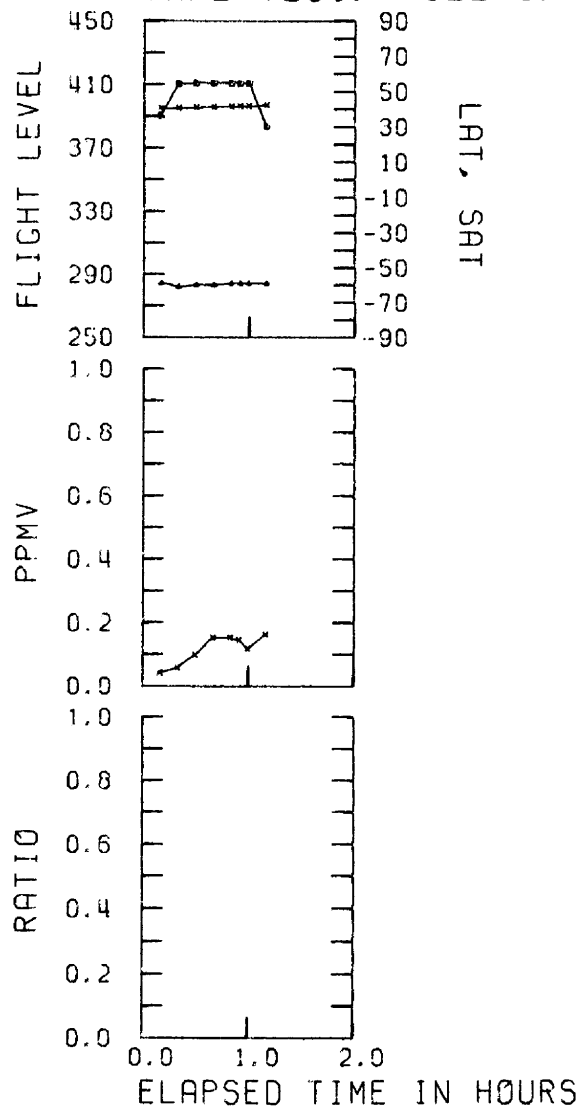


C-175

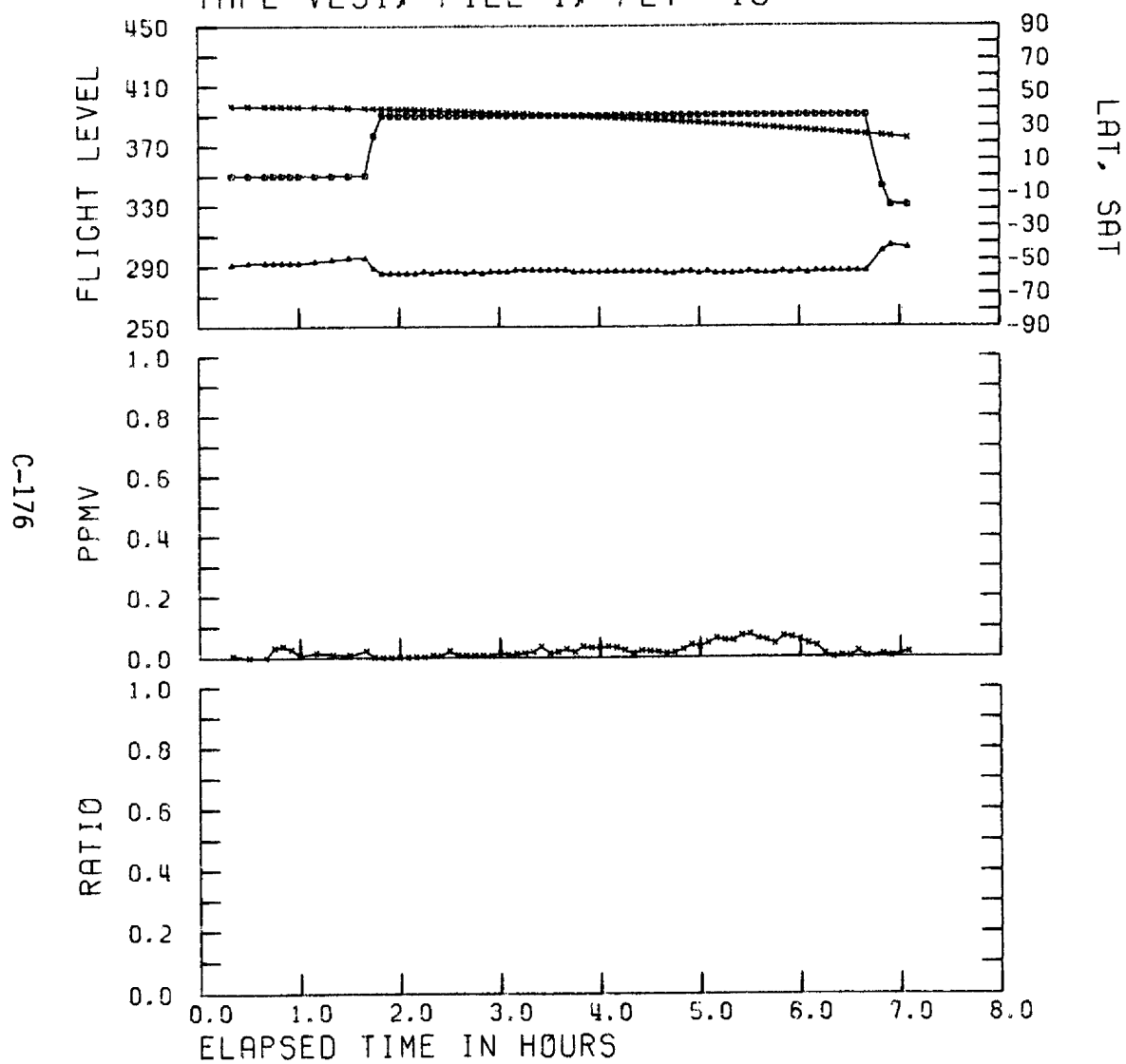
LAX TO DEN DEPARTURE 5 JUN 79
TAPE VL31, FILE 1, FLT 16



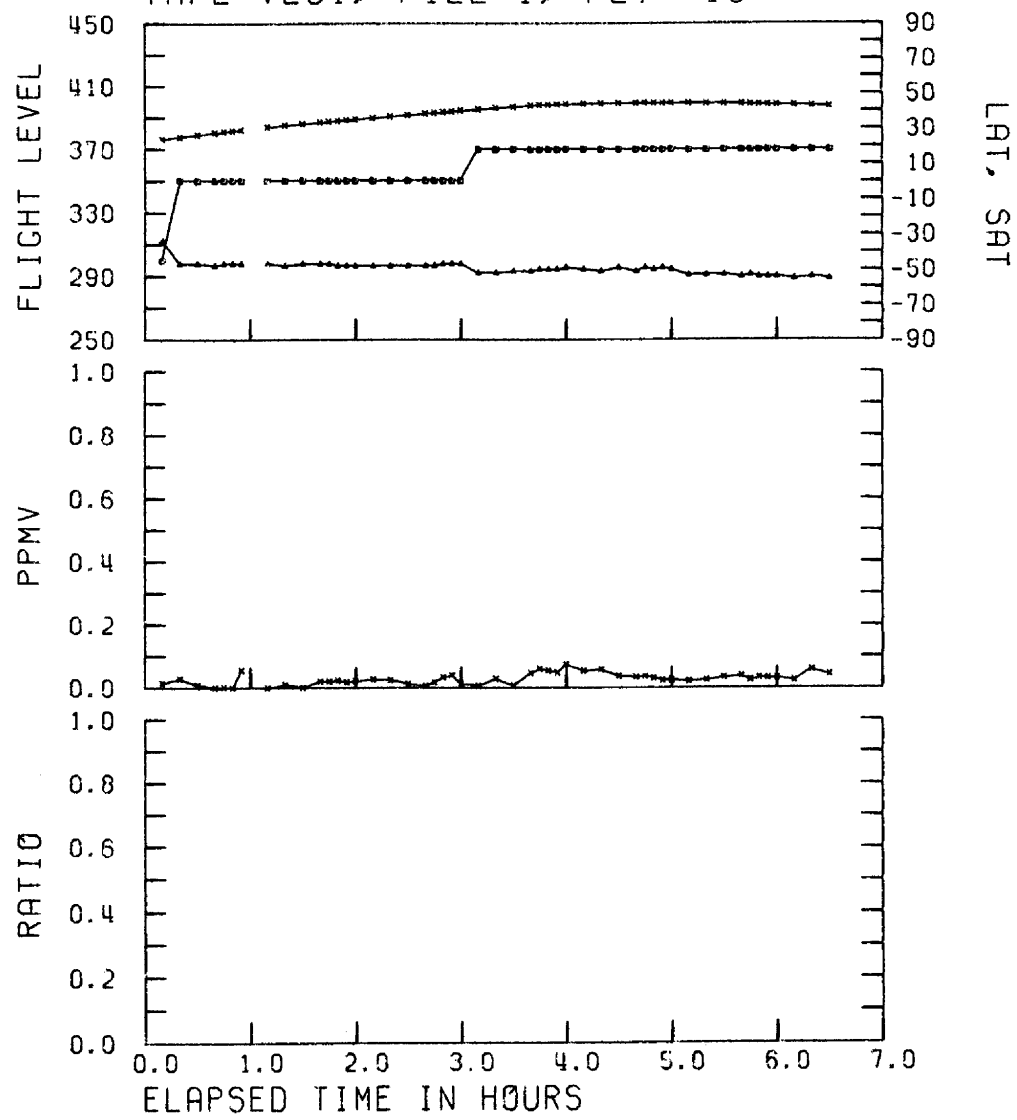
DEN TO ORD DEPARTURE 5 JUN 79
TAPE VL31, FILE 1, FLT 17



ORD TO HNL DEPARTURE 5 JUN 79
TAPE VL31, FILE 1, FLT 18



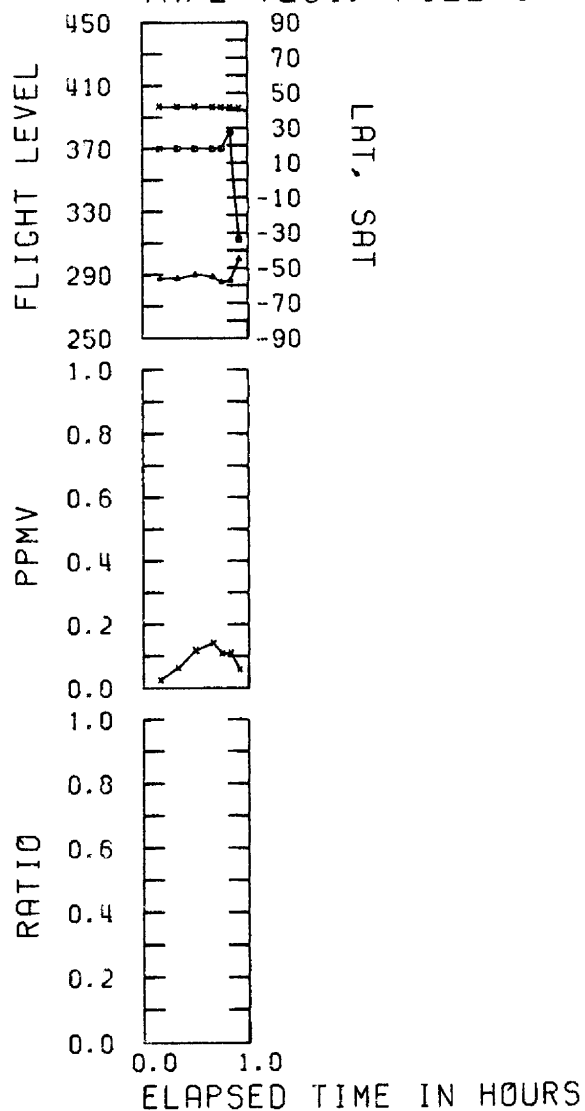
HNL TO ORD DEPARTURE 6 JUN 79
TAPE VL31, FILE 1, FLT 19



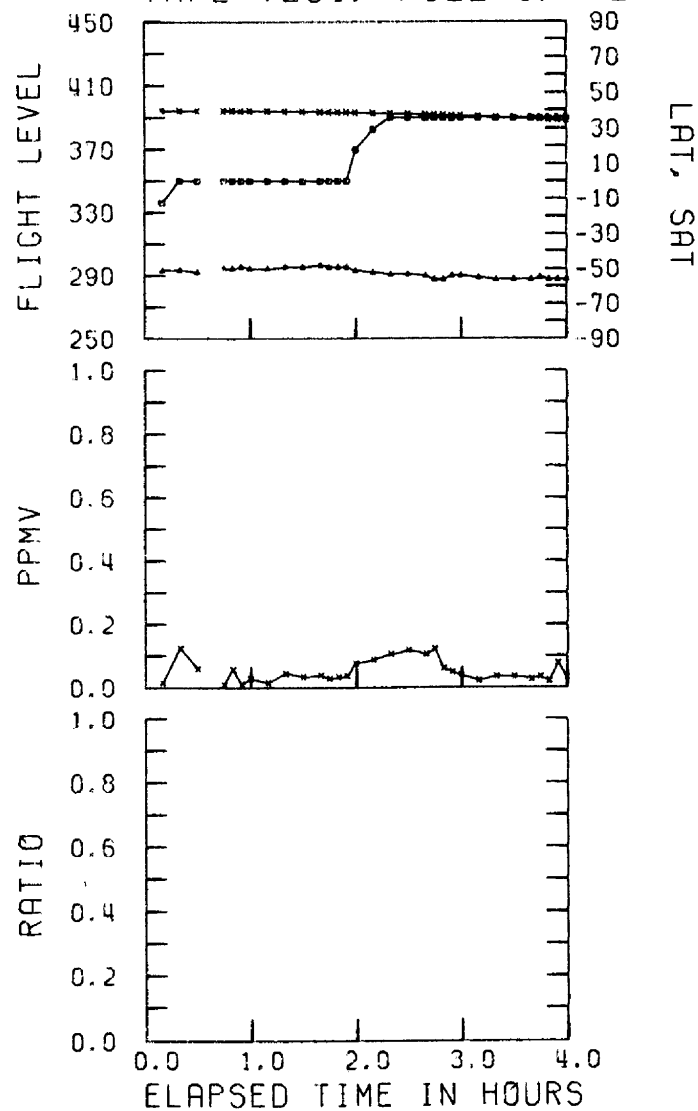
C-177

C-178

ORD TO JFK DEPARTURE 6 JUN 79
TAPE VL31, FILE 1, FLT 20

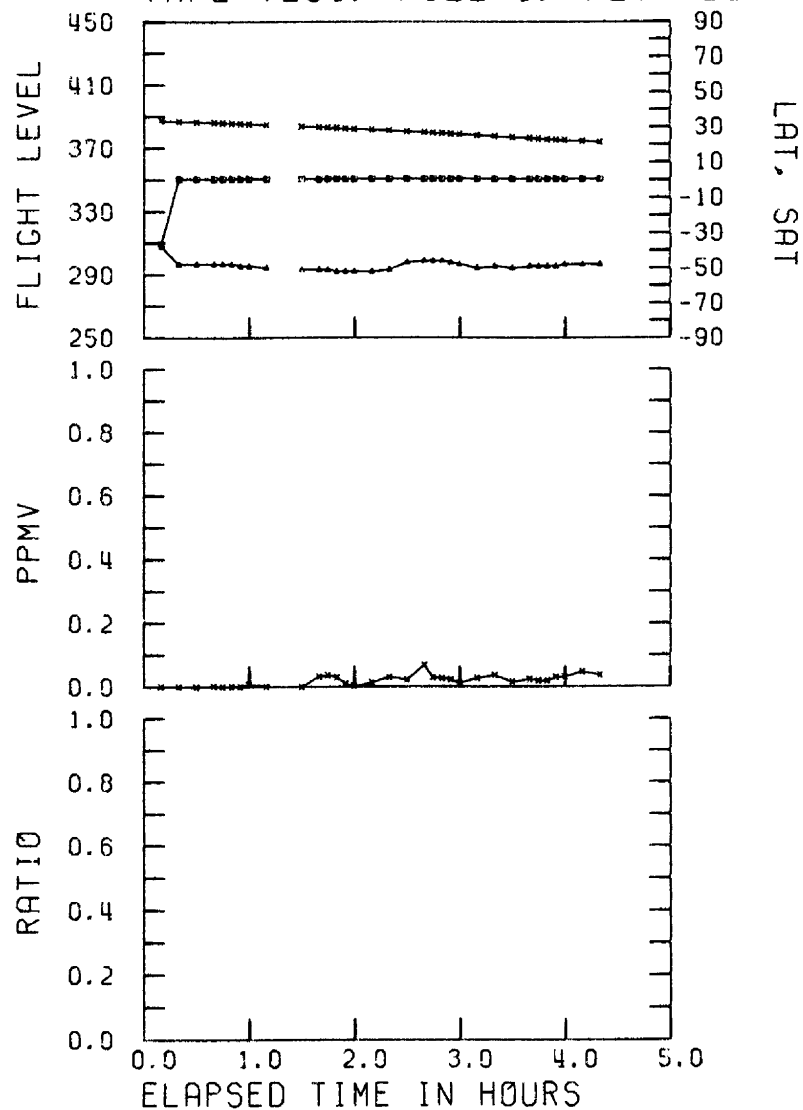


JFK TO LAX DEPARTURE 6 JUN 79
TAPE VL31, FILE 1, FLT 21

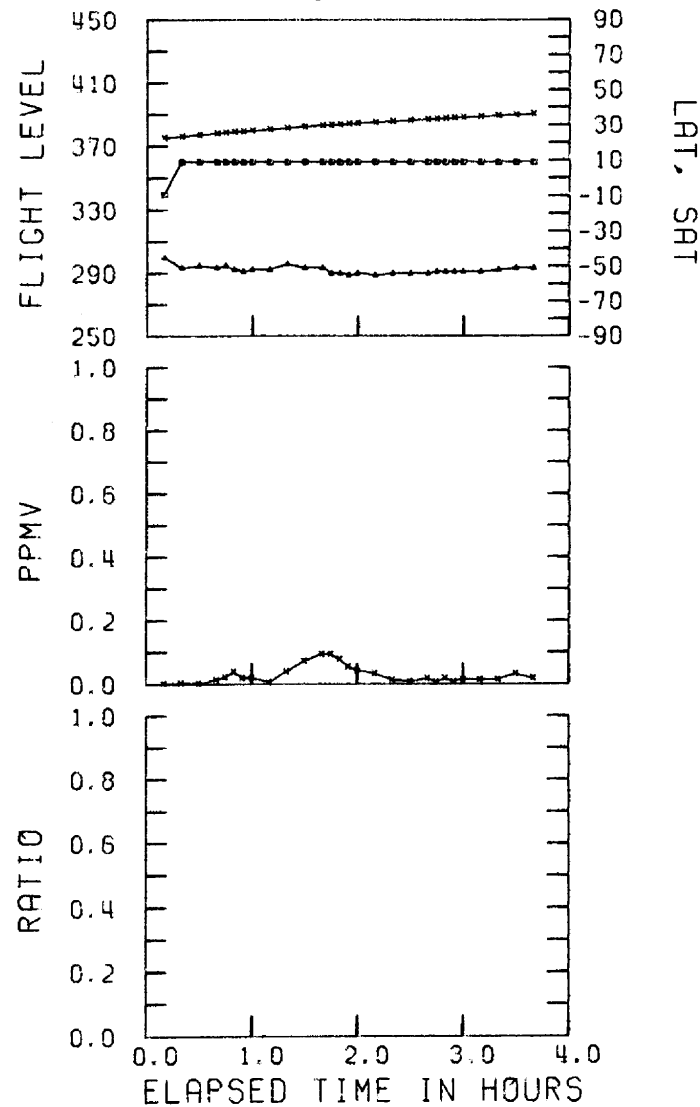


C-179

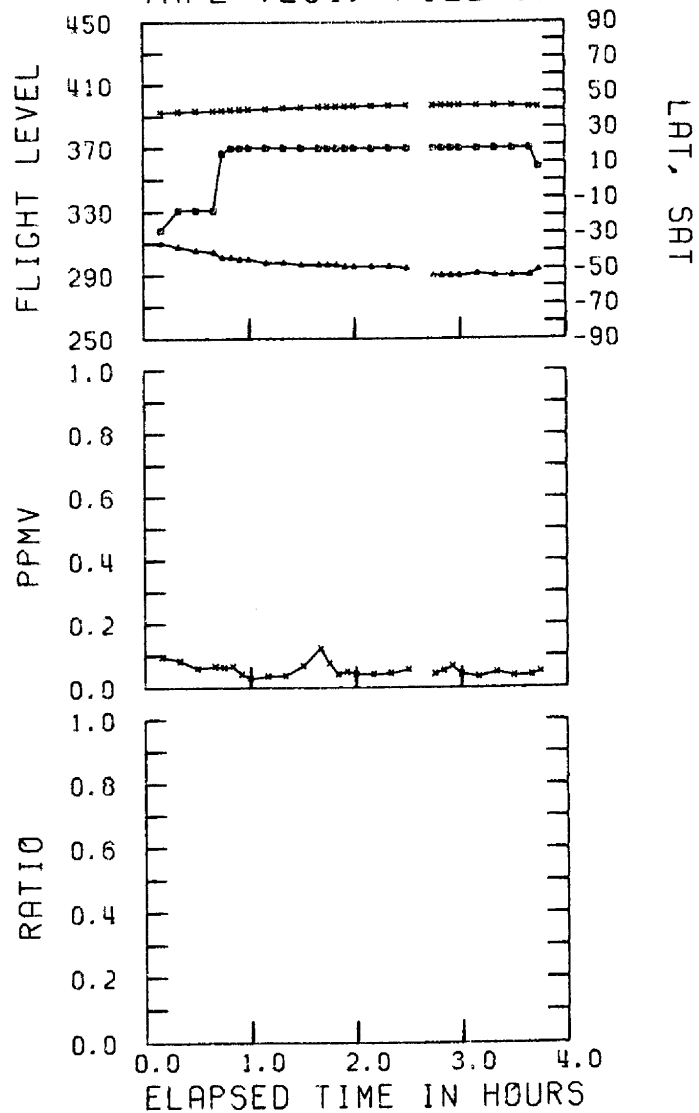
LAX TO HNL DEPARTURE 7 JUN 79
TAPE VL31, FILE 1, FLT 22



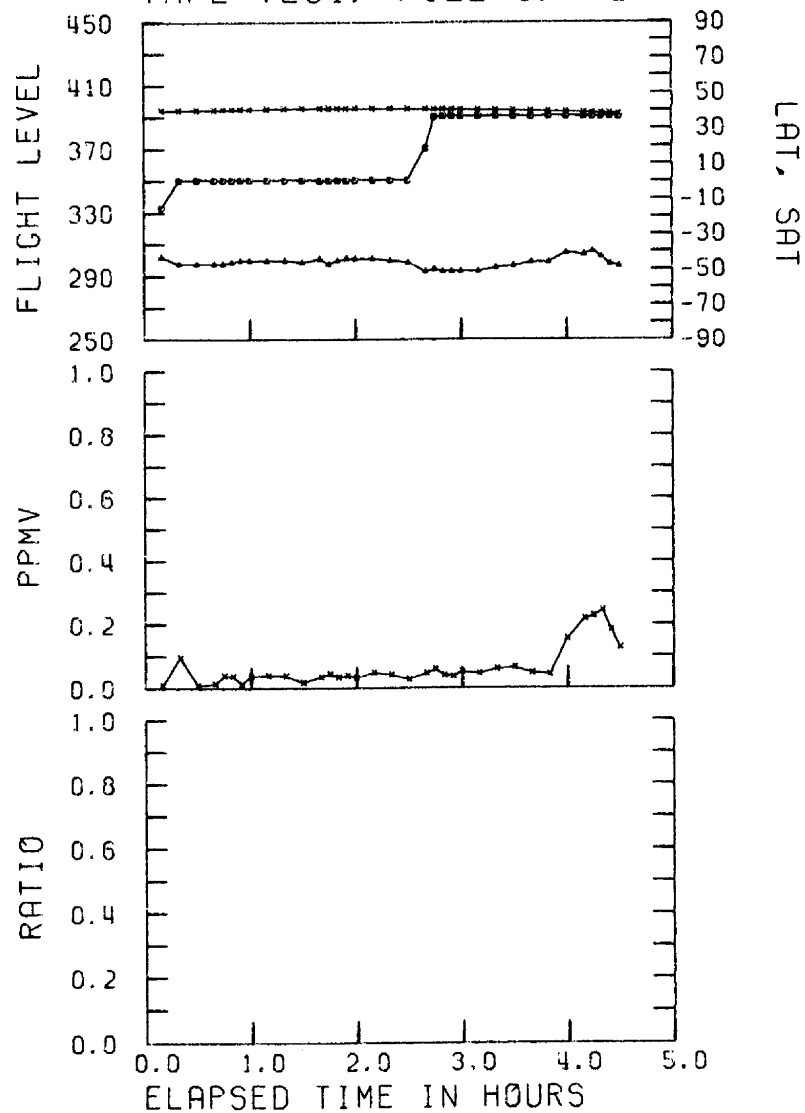
HNL TO SFO DEPARTURE 7 JUN 79
TAPE VL31, FILE 1, FLT 23



SFO TO JFK DEPARTURE 7 JUN 79
TAPE VL31, FILE 1, FLT 24

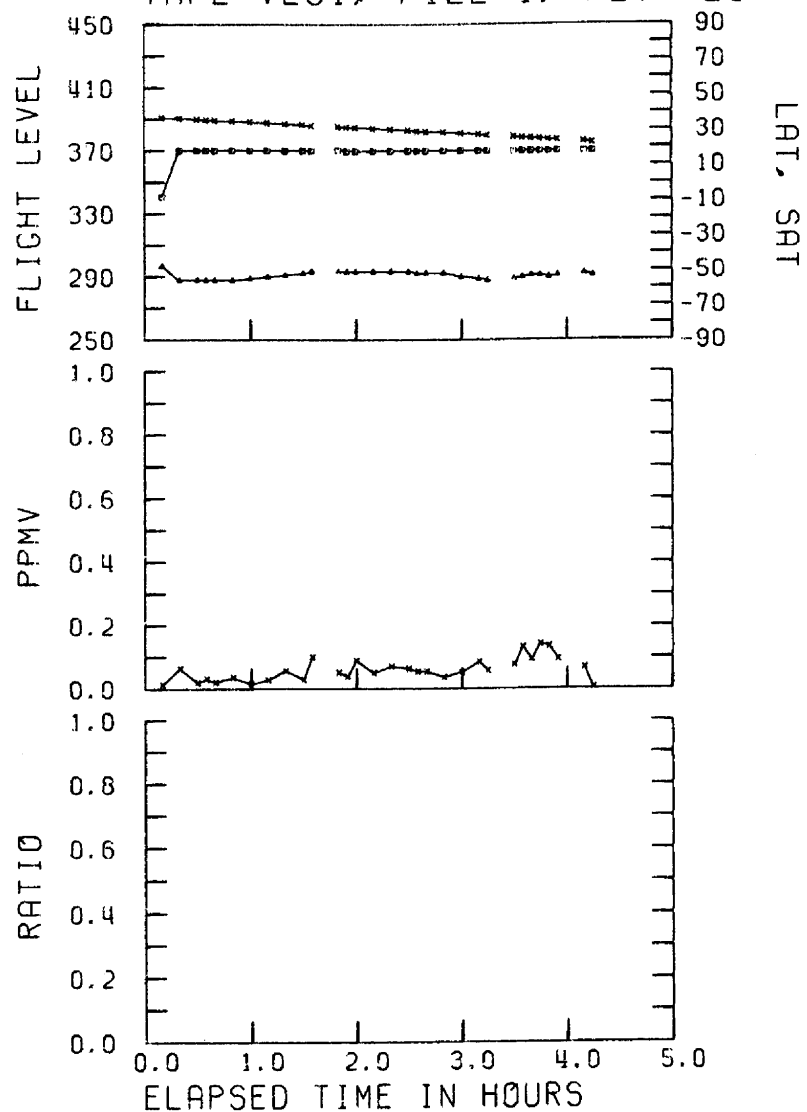


JFK TO SFO DEPARTURE 8 JUN 79
TAPE VL31, FILE 1, FLT 25

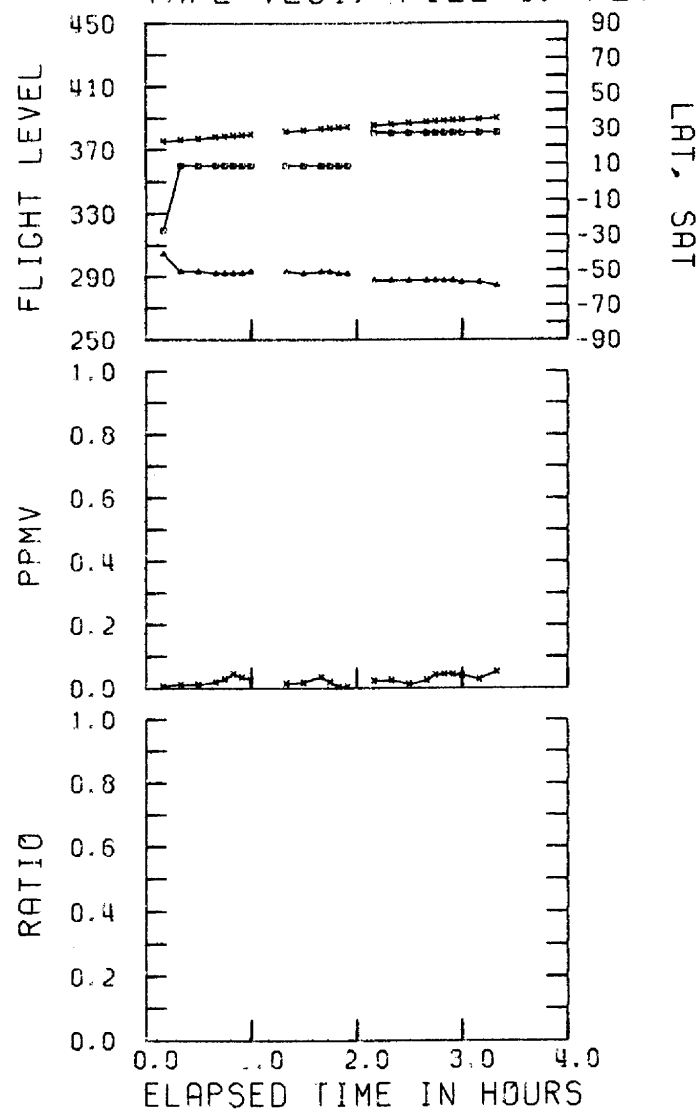


C-181

SFO TO HNL DEPARTURE 8 JUN 79
TAPE VL31, FILE 1, FLT 26

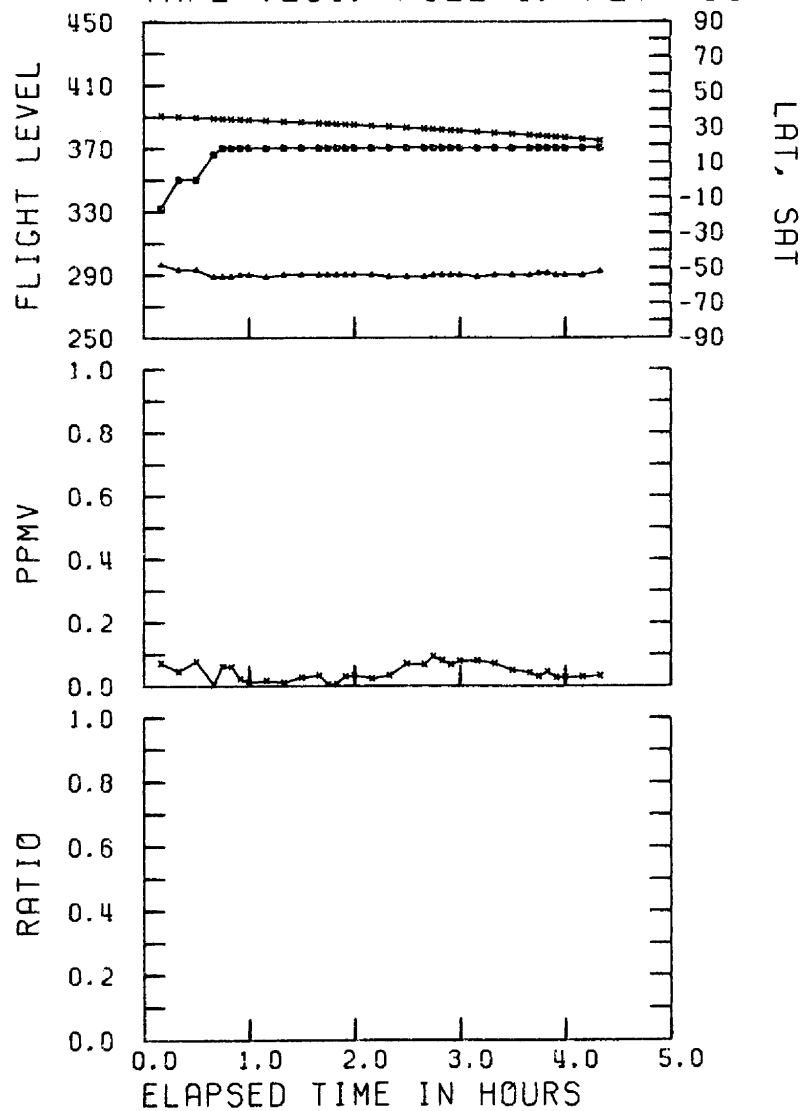


HNL TO SFO DEPARTURE 8 JUN 79
TAPE VL31, FILE 1, FLT 27

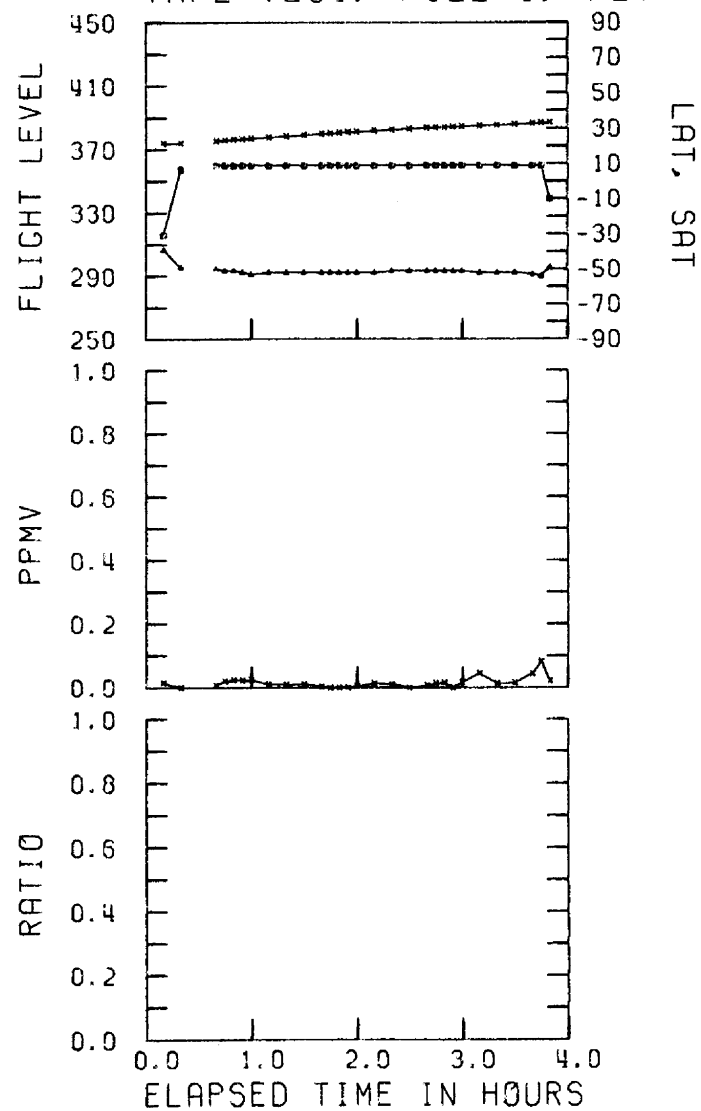


C-182

SFO TO HNL DEPARTURE 9 JUN 79
TAPE VL31, FILE 1, FLT 28

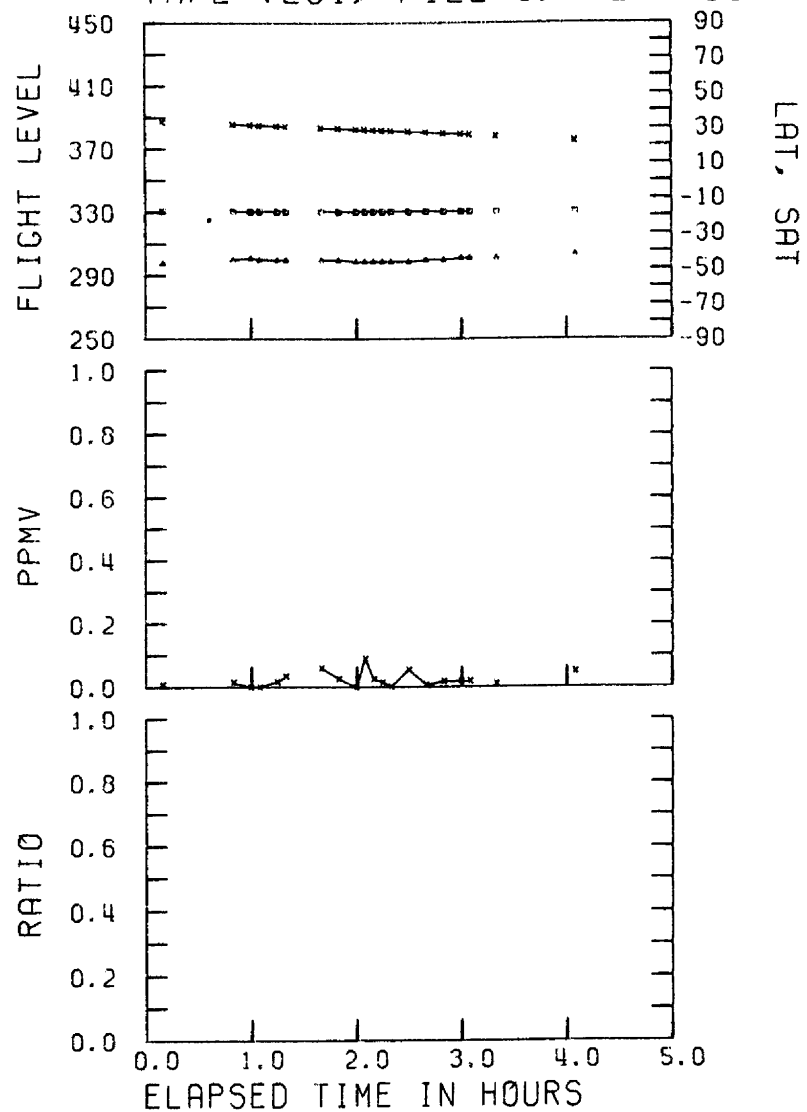


HNL TO LAX DEPARTURE 9 JUN 79
TAPE VL31, FILE 1, FLT 29

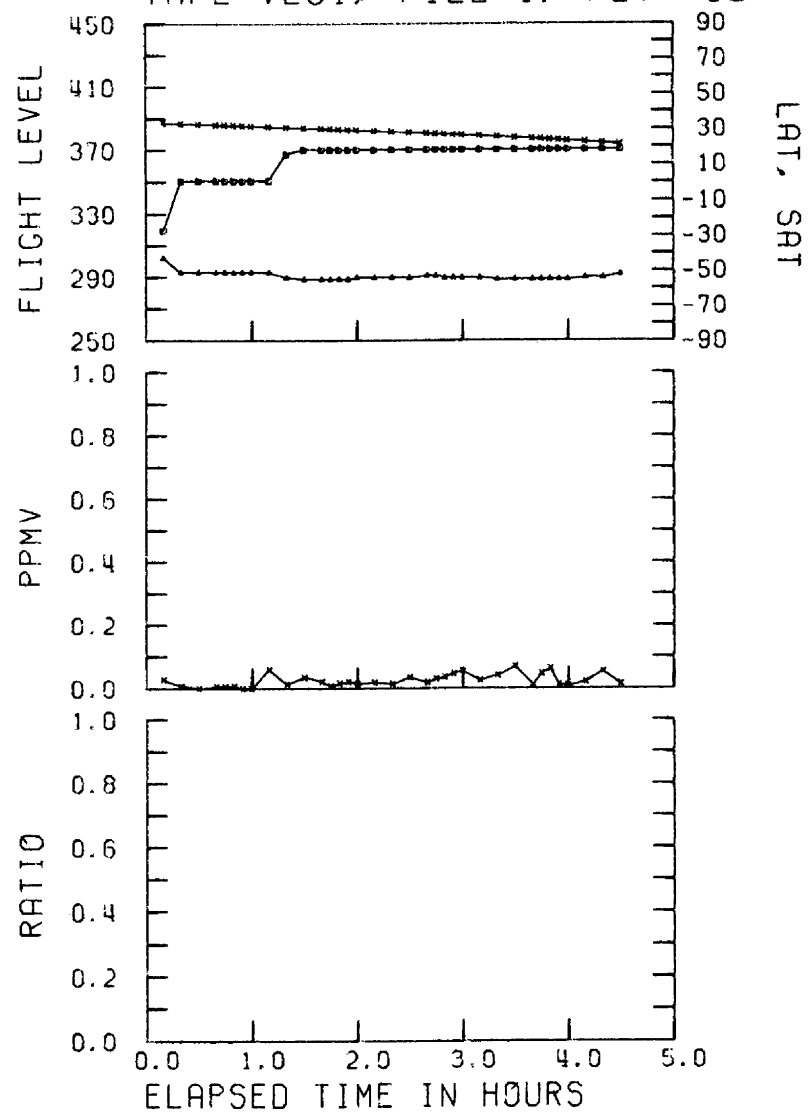


C-183

LAX TO HNL DEPARTURE 9 JUN 79
TAPE VL31, FILE 1, FLT 30

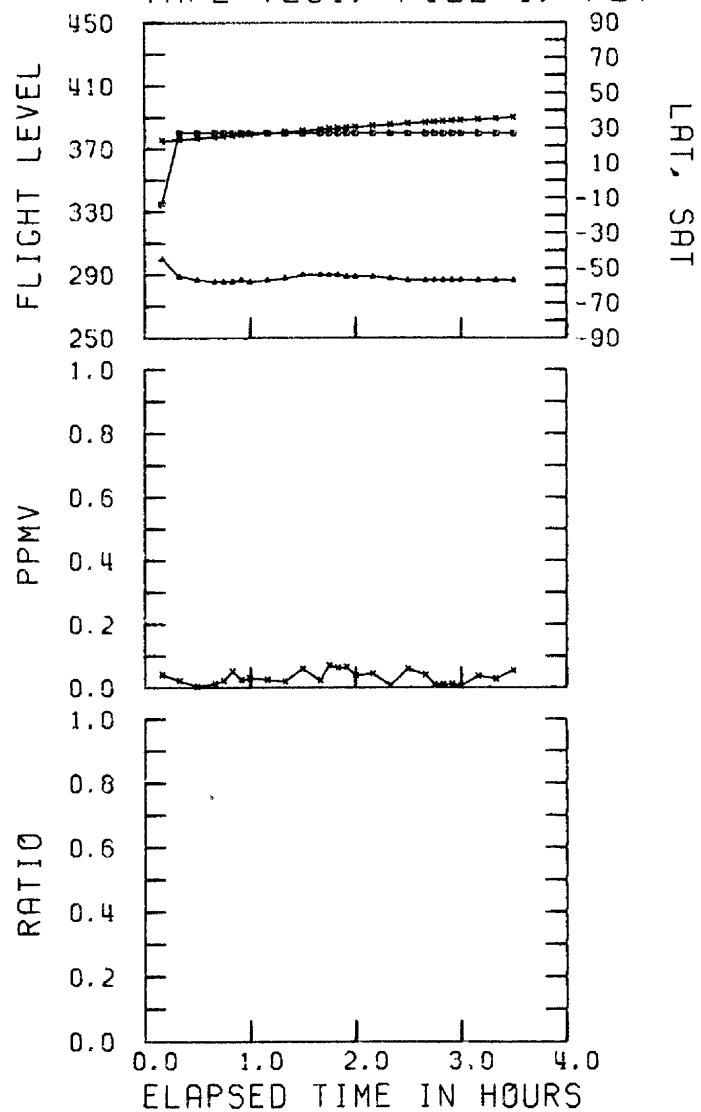


LAX TO HNL DEPARTURE 10 JUN 79
TAPE VL31, FILE 1, FLT 32

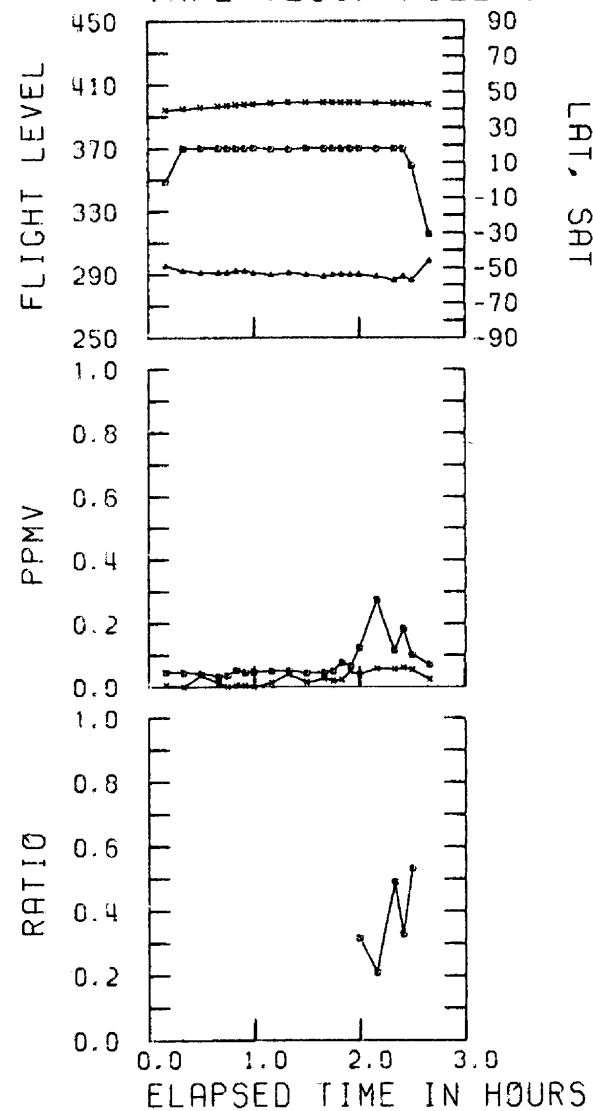


C-184

HNL TO SFO DEPARTURE 10 JUN 79
TAPE VL31, FILE 1, FLT 33

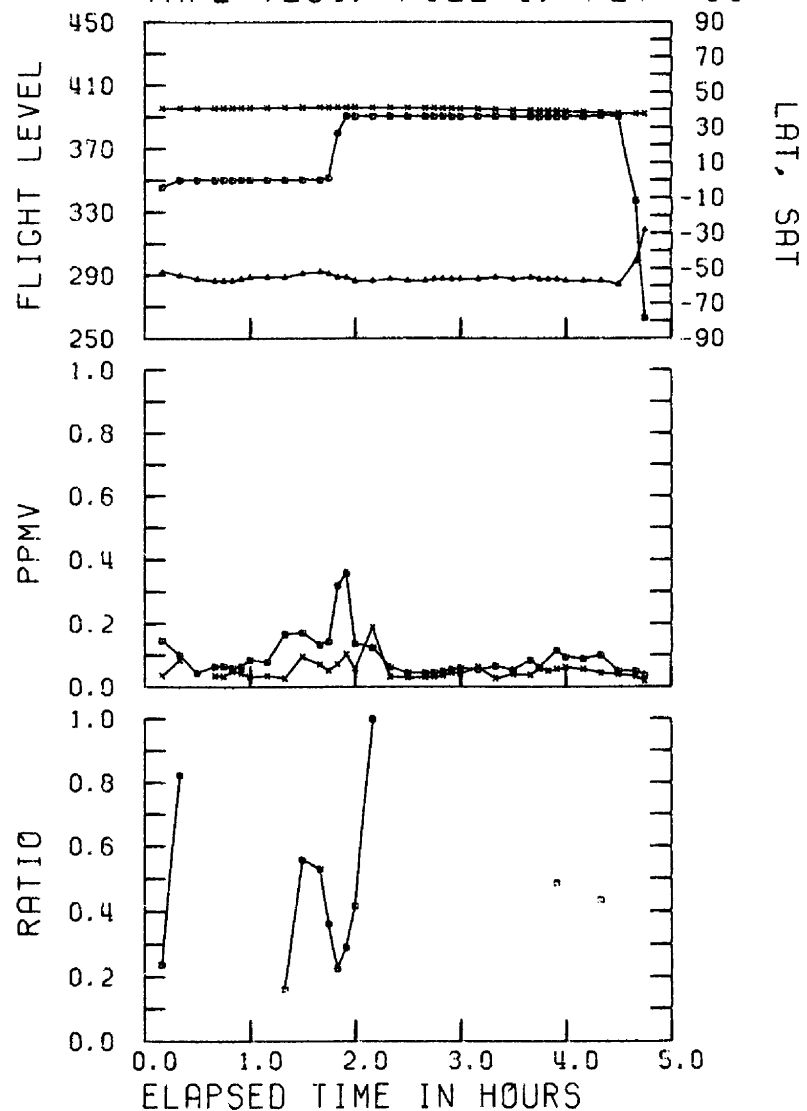


SFO TO ORD DEPARTURE 12 JUN 79
TAPE VL31, FILE 1, FLT 34

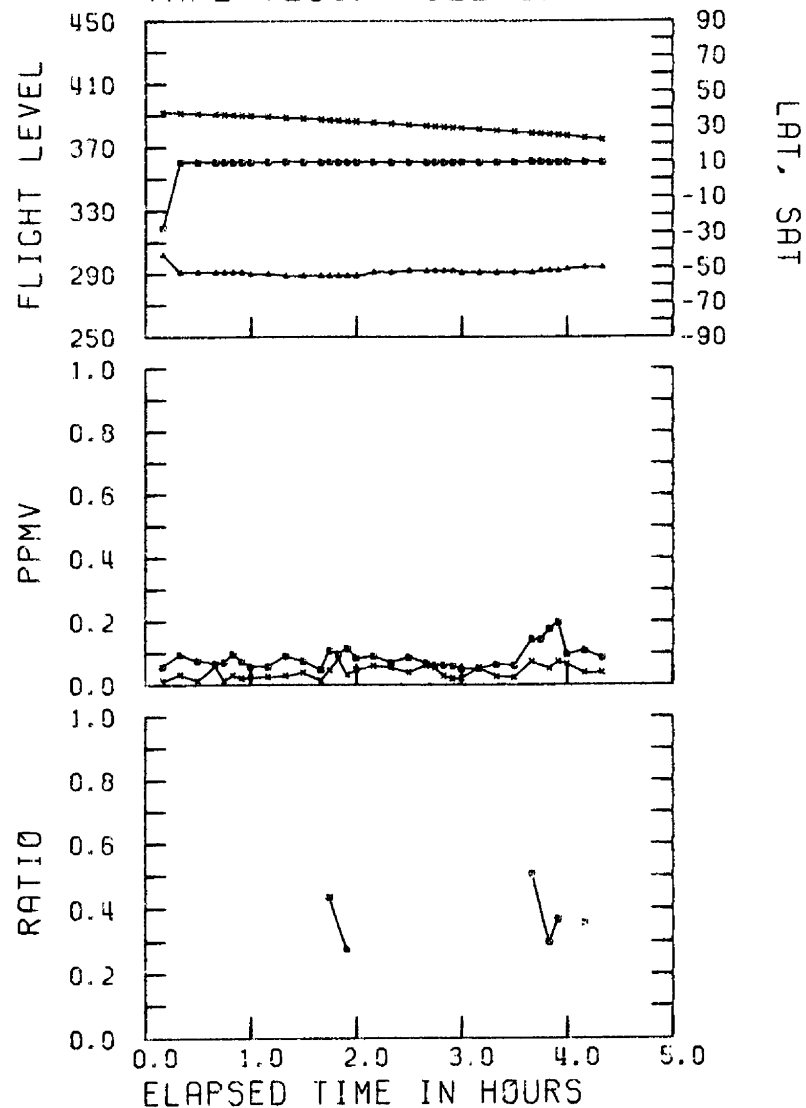


C-185

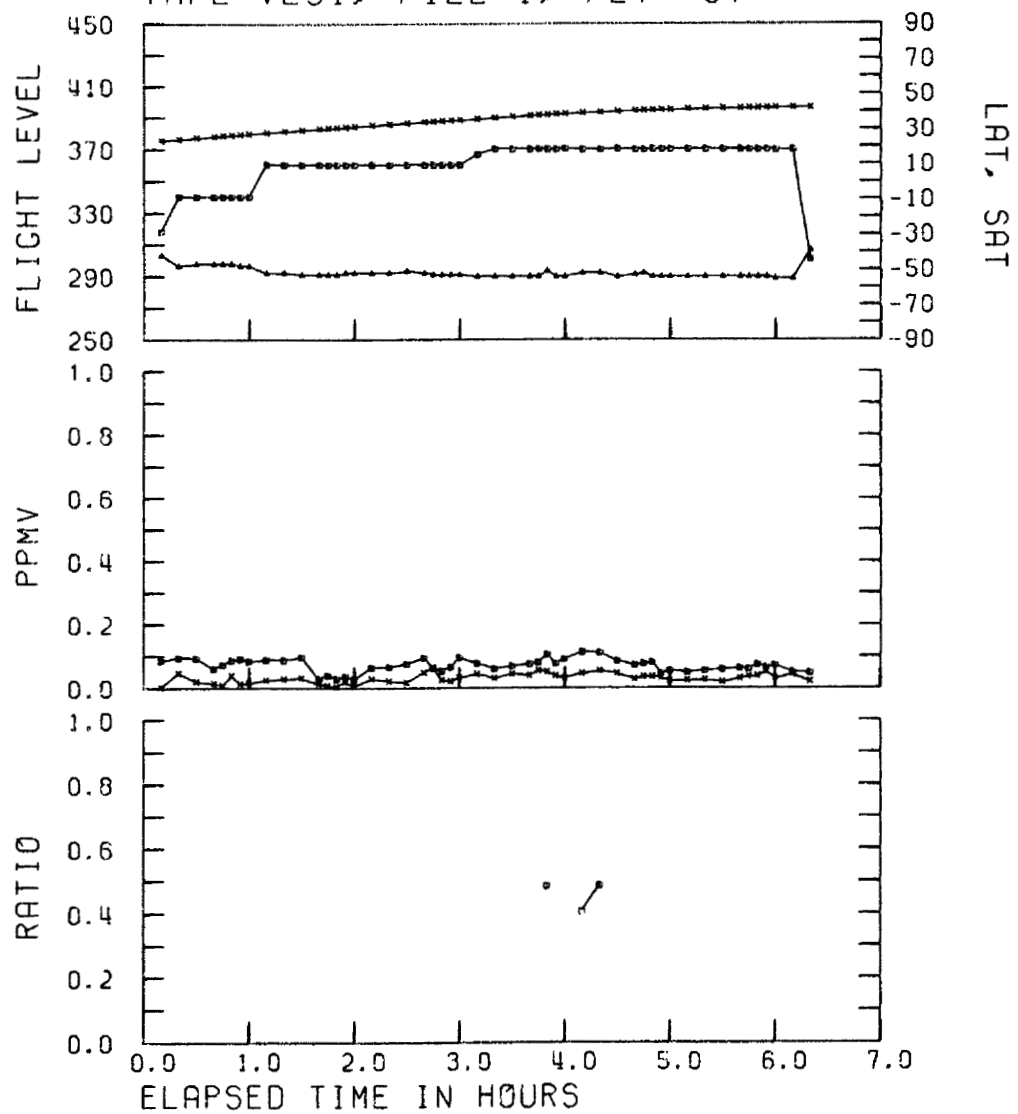
JFK TO SFO DEPARTURE 13 JUN 79
TAPE VL31, FILE 1, FLT 35



SFO TO HNL DEPARTURE 13 JUN 79
TAPE VL31, FILE 1, FLT 36

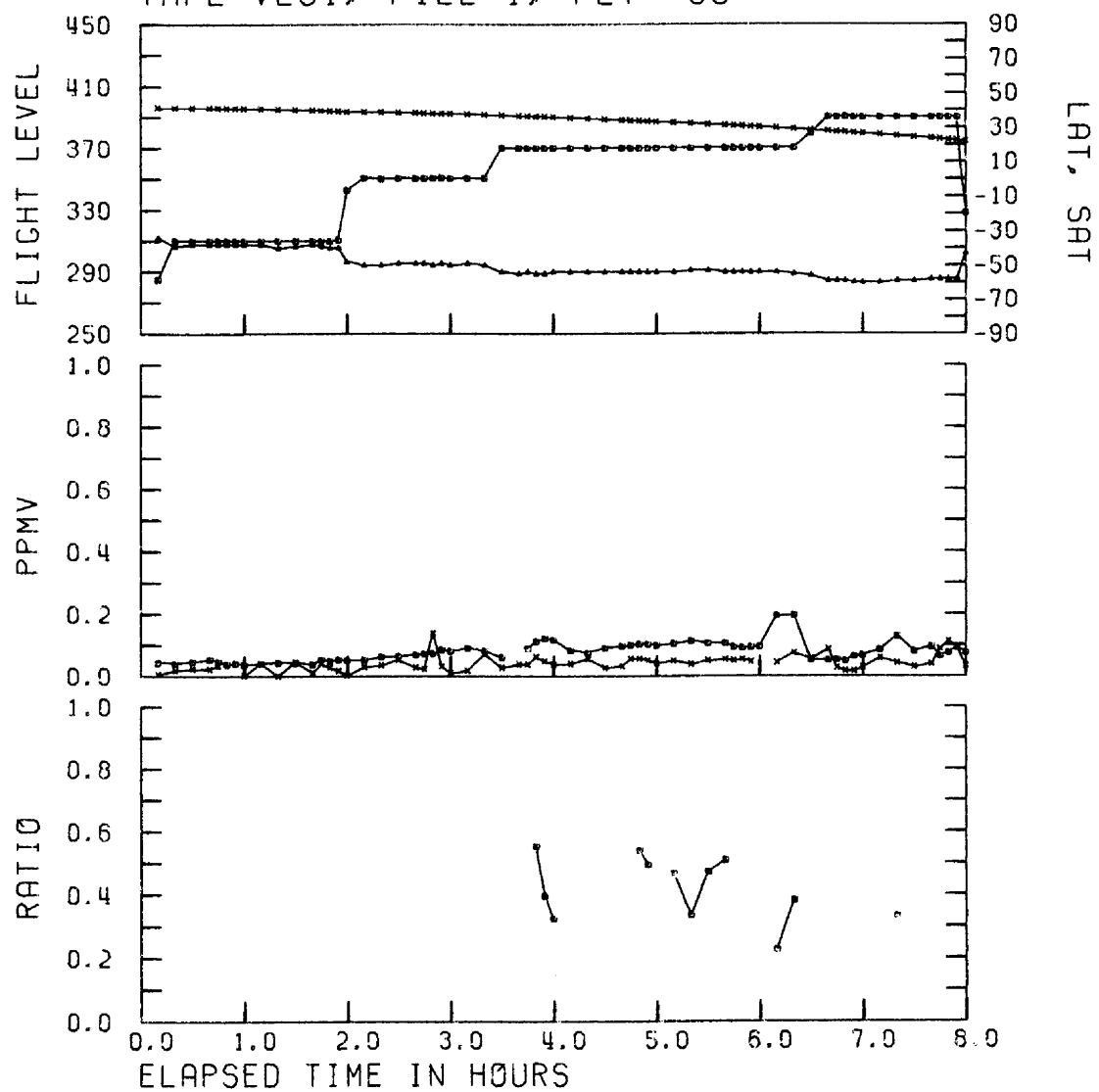


HNL TO ORD DEPARTURE 14 JUN 79
TAPE VL31, FILE 1, FLT 37



C-186

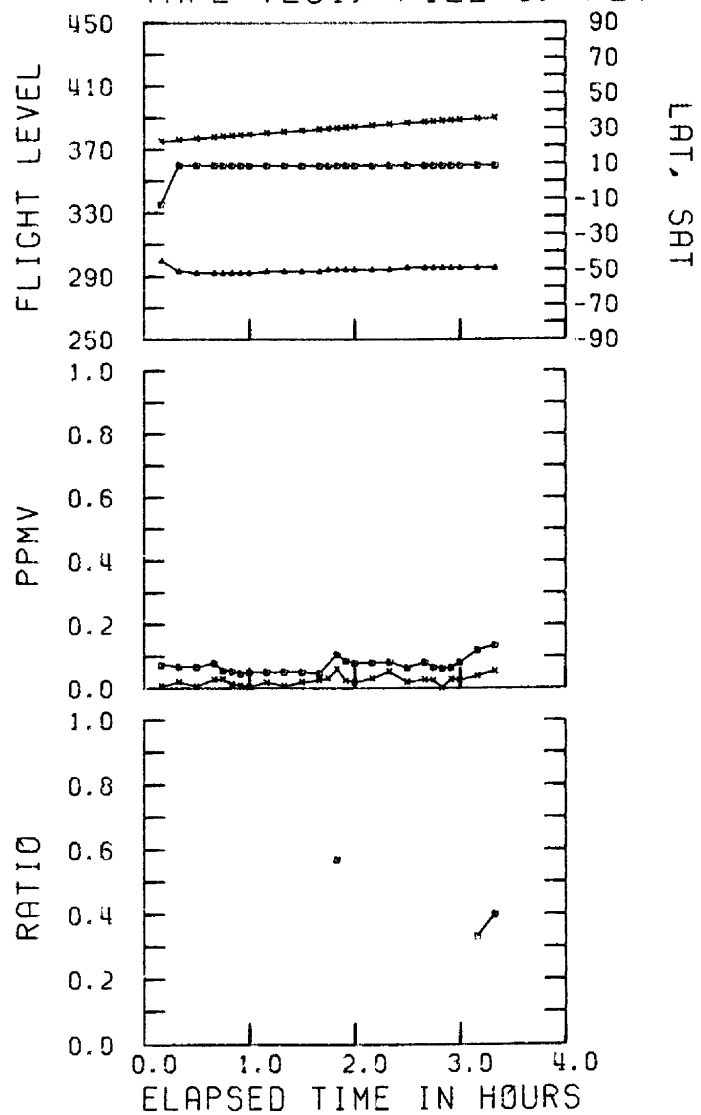
ORD TO HNL DEPARTURE 14 JUN 79
 TAPE VL31, FILE 1, FLT 38



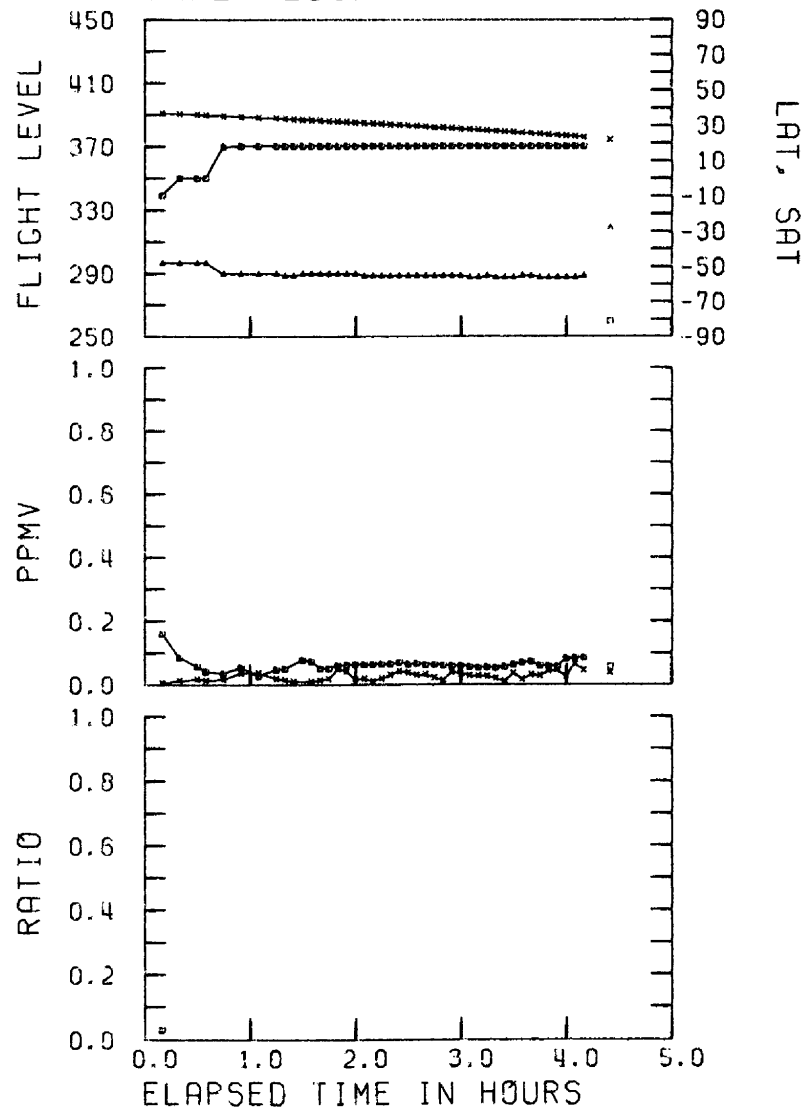
C-187

88T-C

HNL TO SFO DEPARTURE 15 JUN 79
TAPE VL31, FILE 1, FLT 39

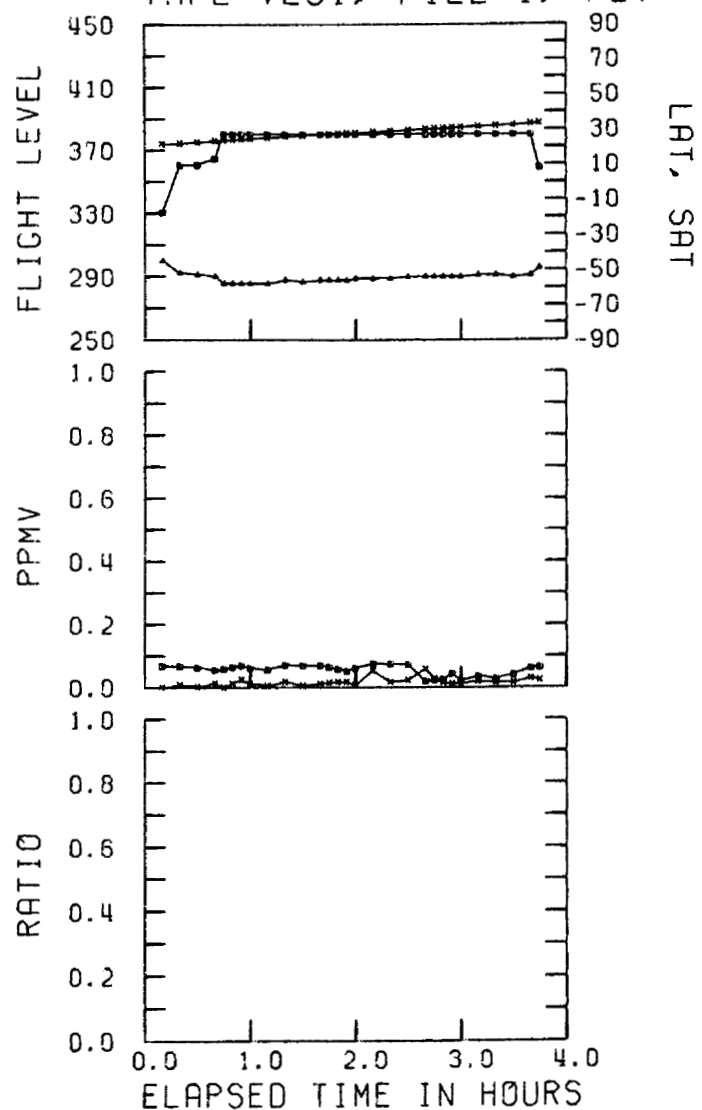


SFO TO HNL DEPARTURE 15 JUN 79
TAPE VL31, FILE 1, FLT 40

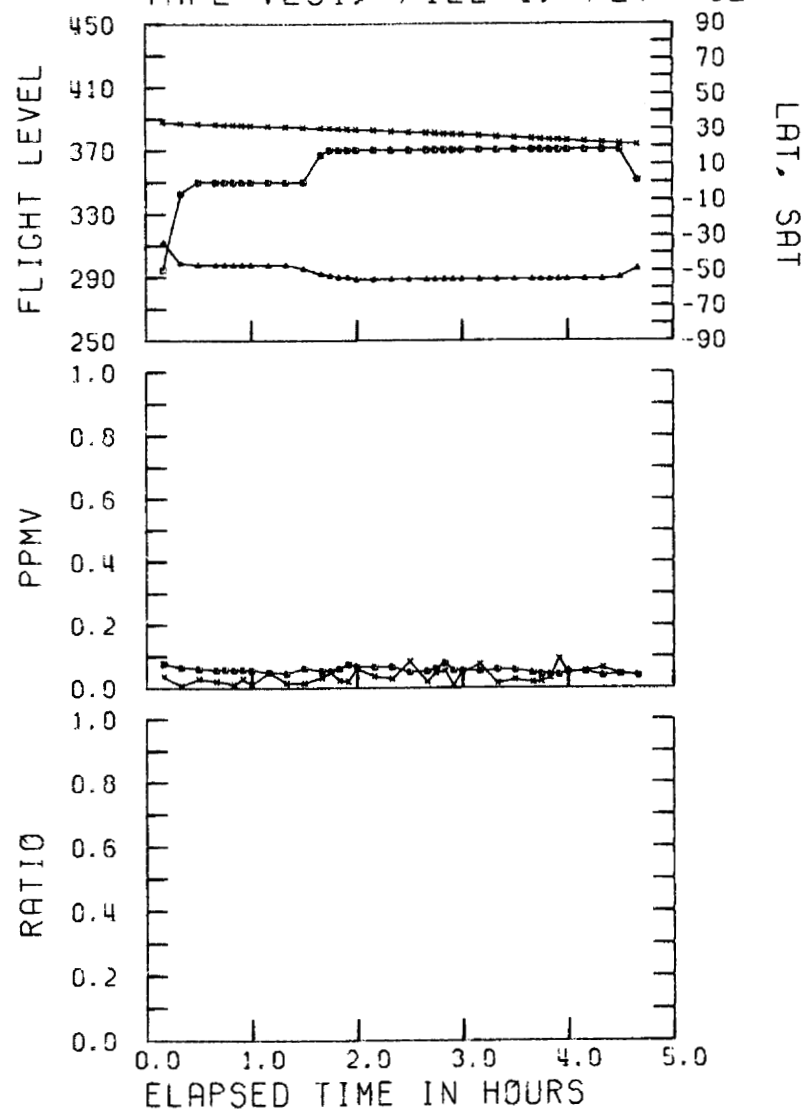


68I-C

HNL TO LAX DEPARTURE 16 JUN 79
TAPE VL31, FILE 1, FLT 41

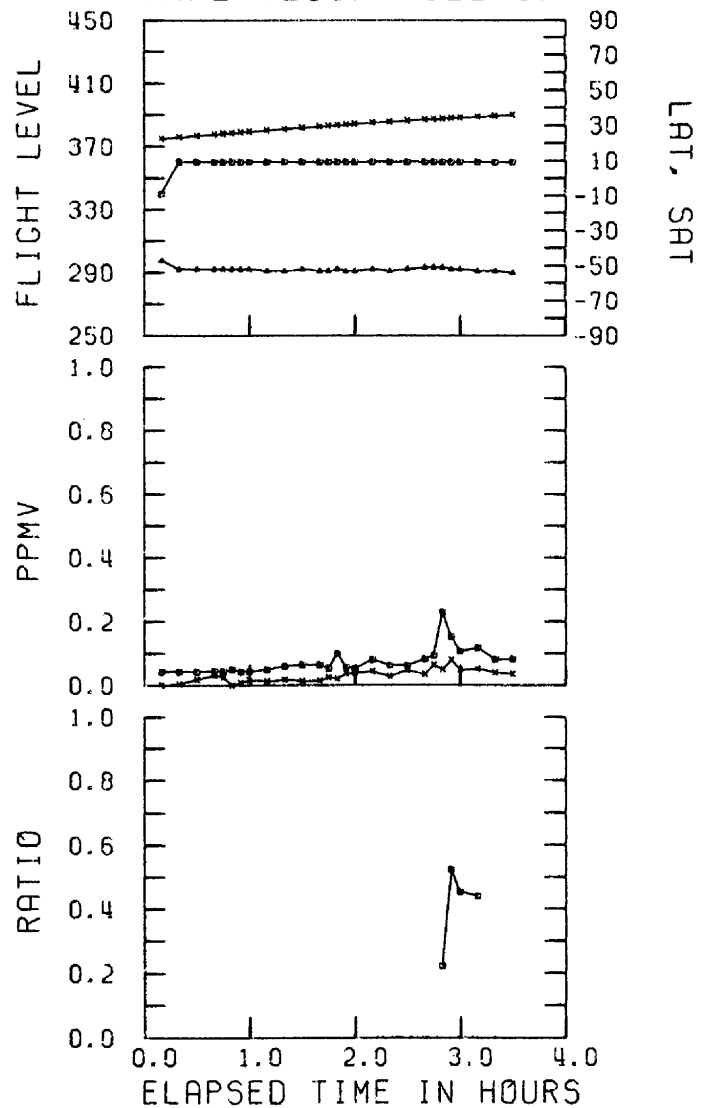


LAX TO HNL DEPARTURE 16 JUN 79
TAPE VL31, FILE 1, FLT 42

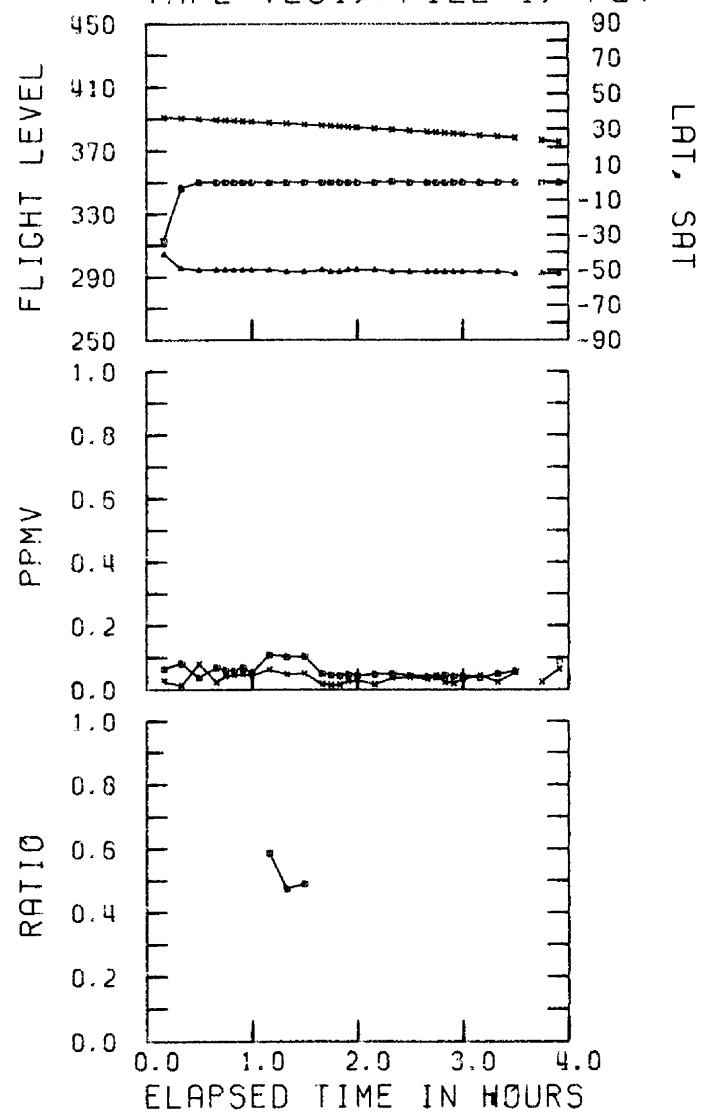


HNL TO SFO DEPARTURE 16 JUN 79
TAPE VL31, FILE 1, FLT 43

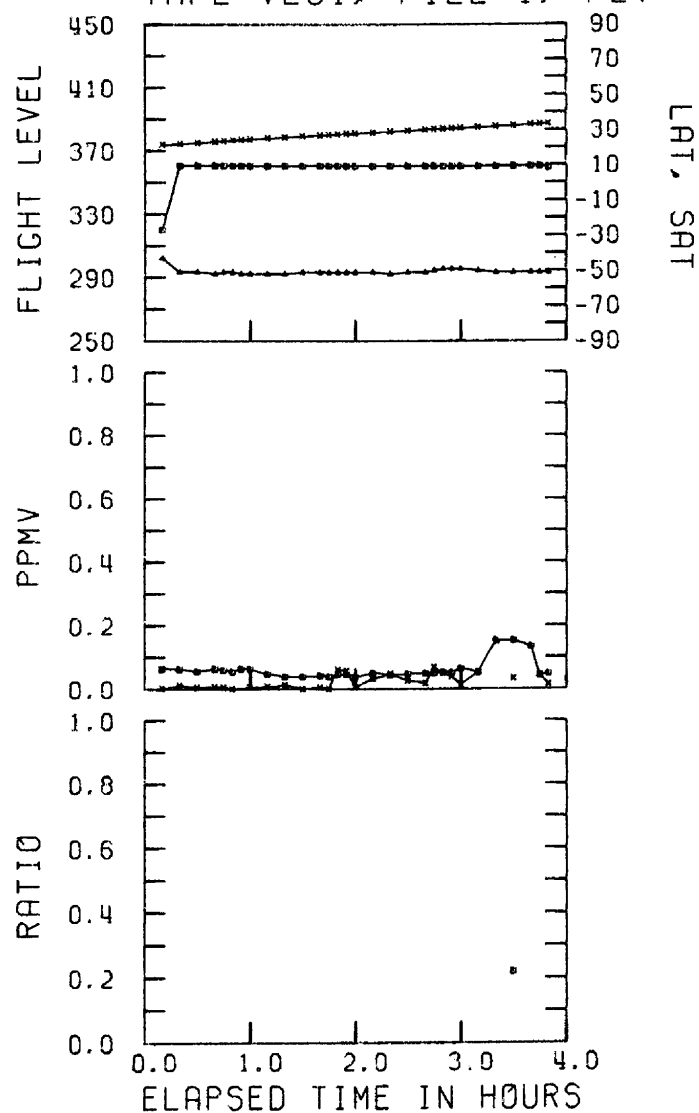
061-3



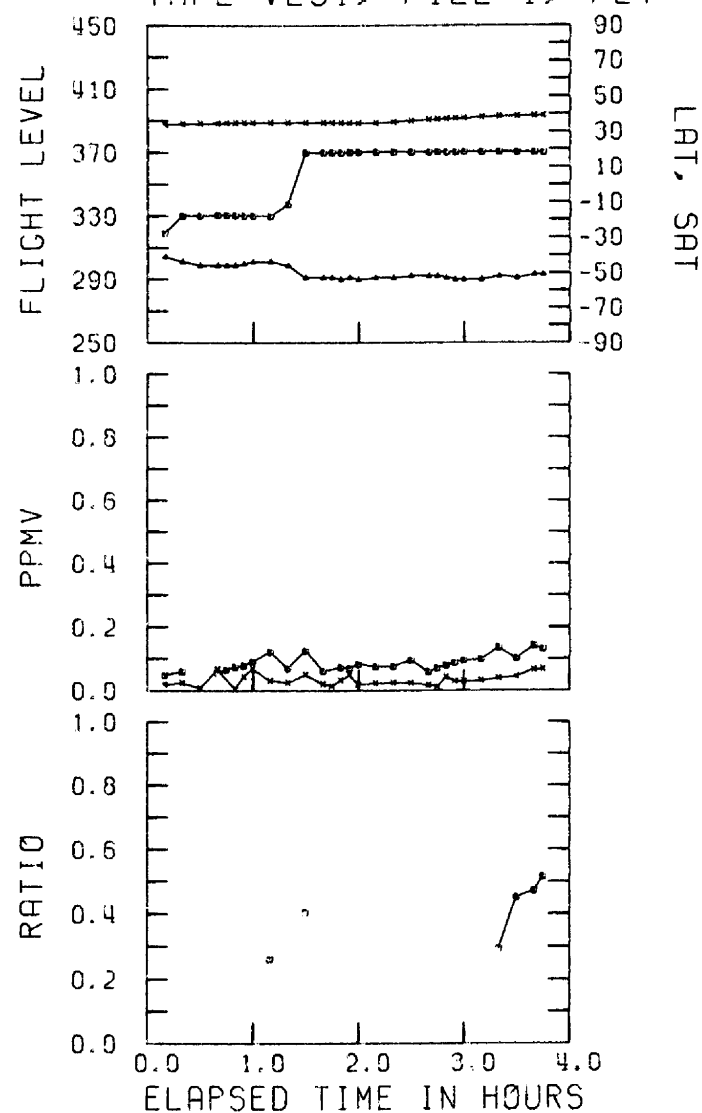
SFO TO HNL DEPARTURE 17 JUN 79
TAPE VL31, FILE 1, FLT 44



HNL TO LAX DEPARTURE 17 JUN 79
TAPE VL31, FILE 1, FLT 45



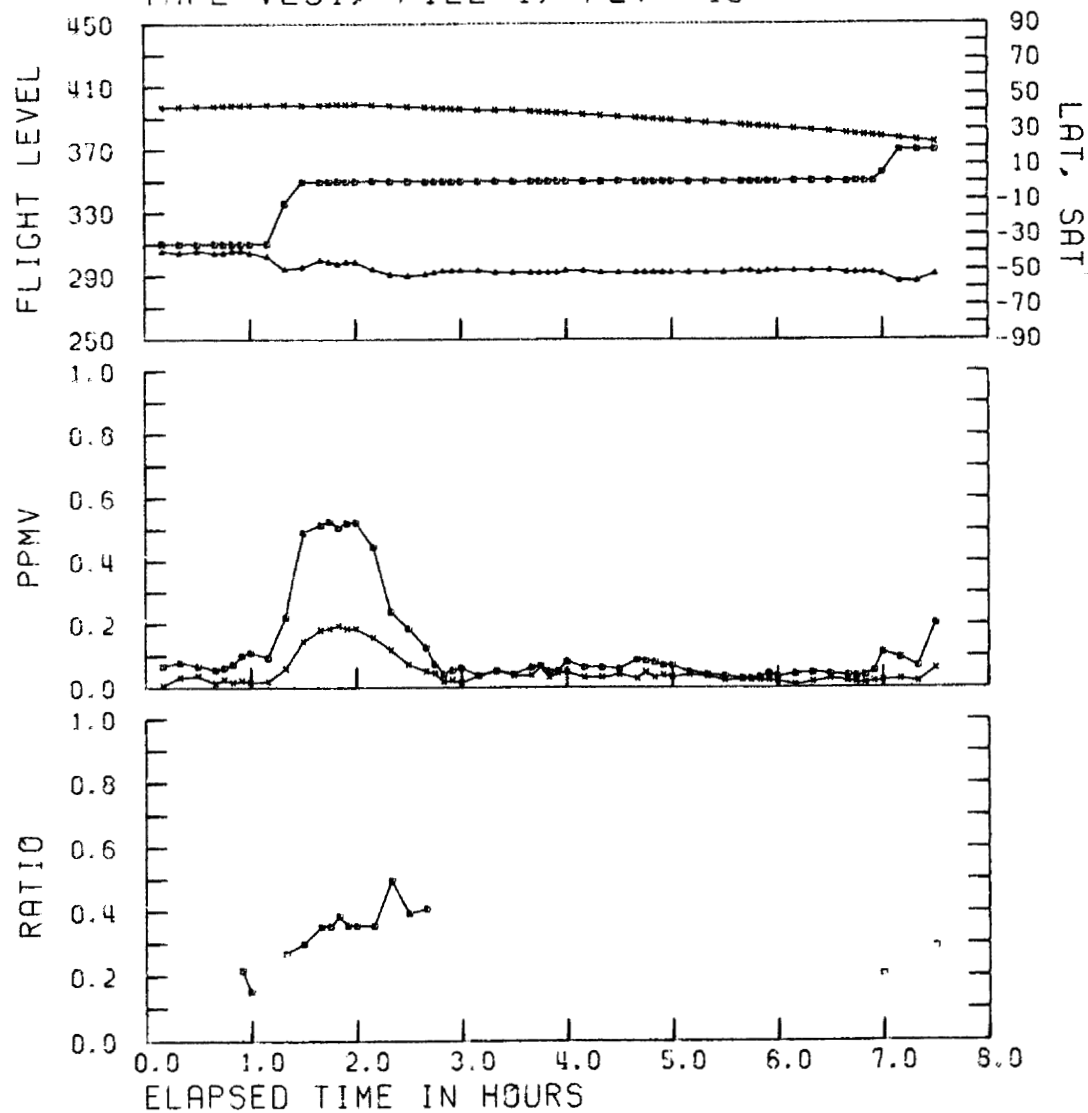
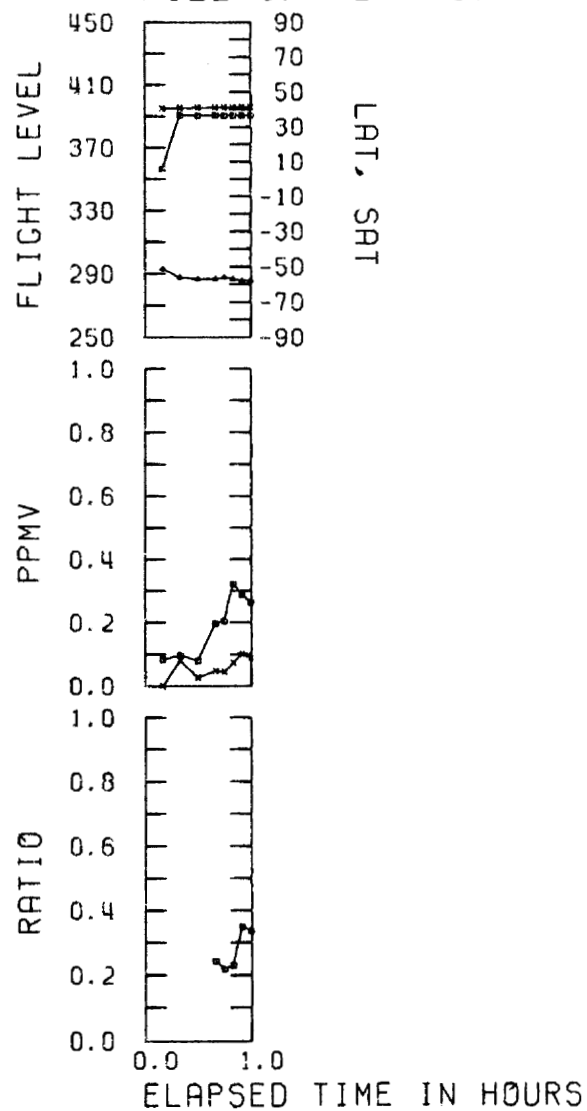
LAX TO JFK DEPARTURE 18 JUN 79
TAPE VL31, FILE 1, FLT 46



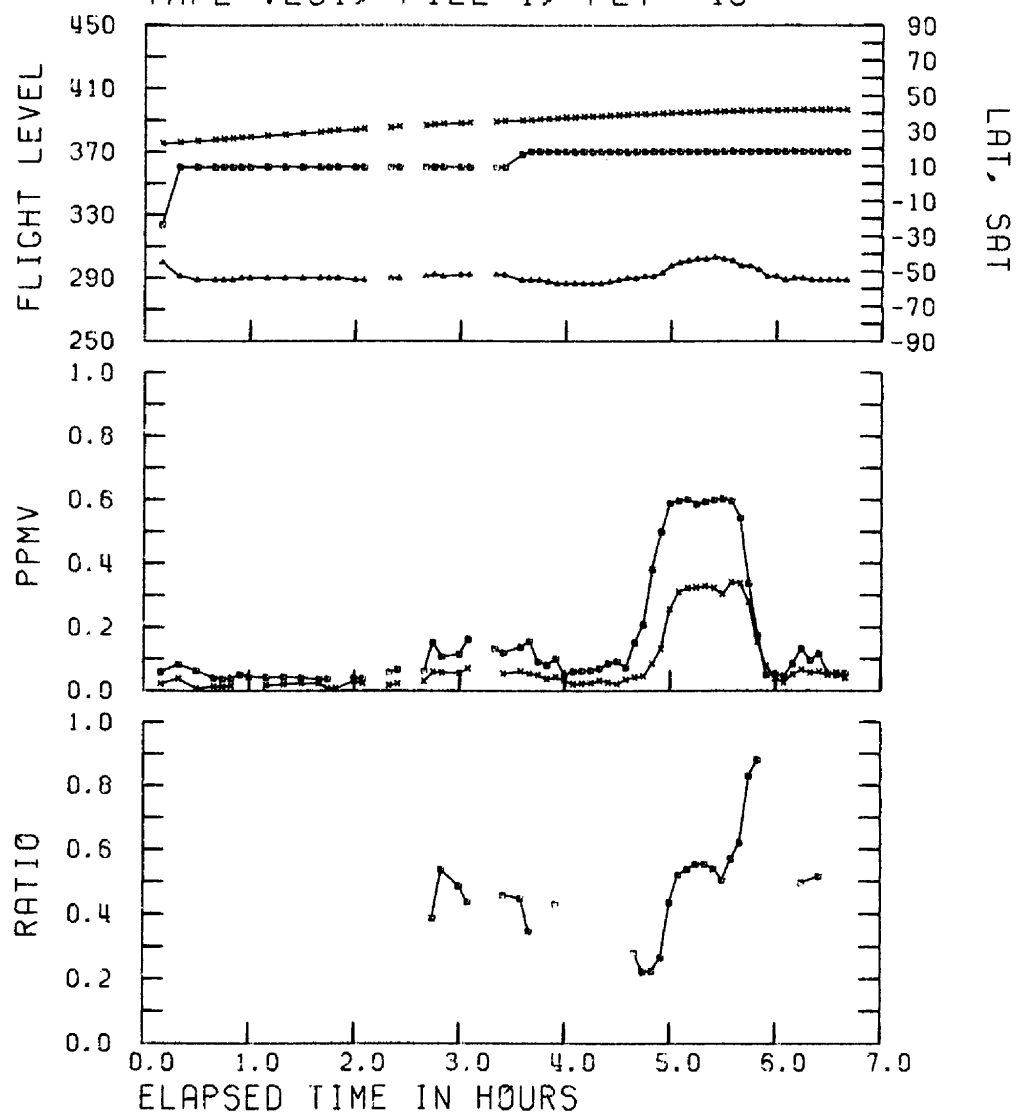
JFK TO ORD
 DEPARTURE 18 JUN 79
 TAPE VL31,
 FILE 1, FLT 47

ORD TO HNL DEPARTURE 18 JUN 79
 TAPE VL31, FILE 1, FLT 48

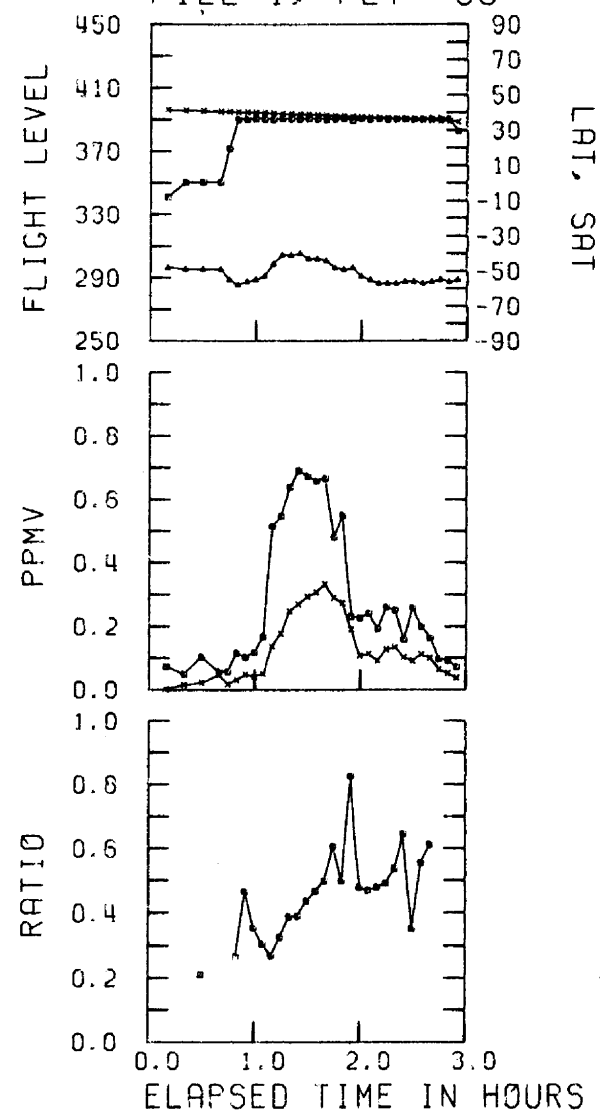
261-C



HNL TO ORD DEPARTURE 19 JUN 79
TAPE VL31, FILE 1, FLT 49

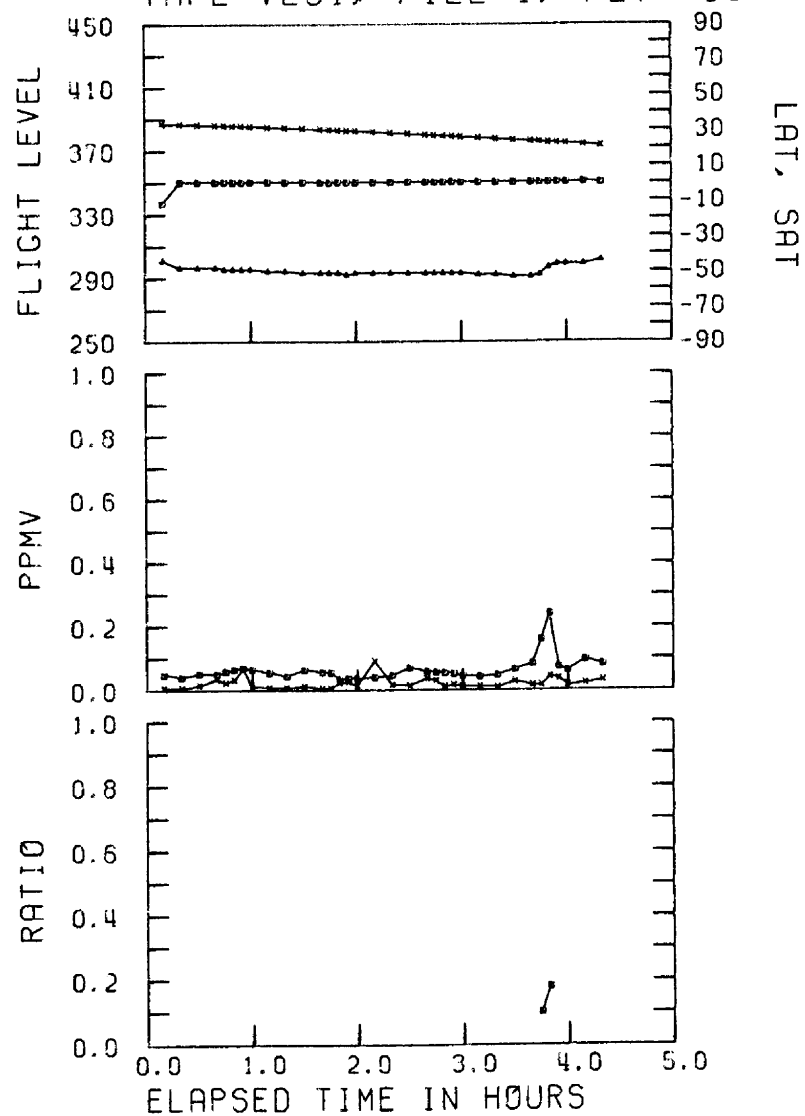


ORD TO LAX
DEPARTURE 19 JUN 79
TAPE VL31,
FILE 1, FLT 50

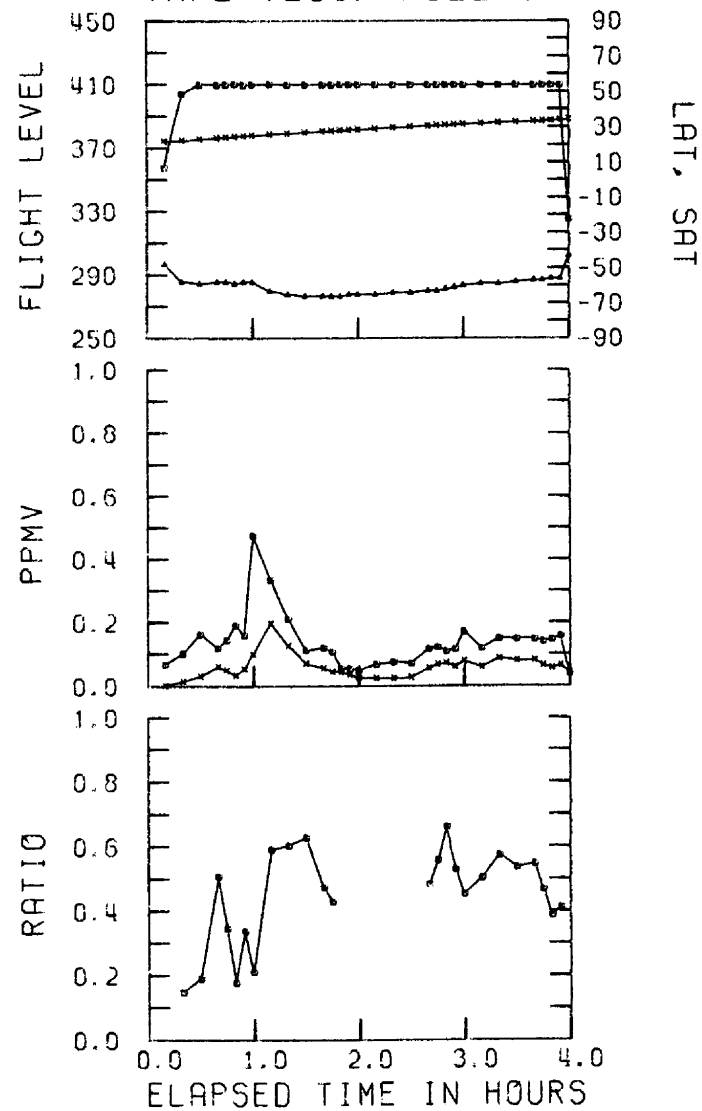


C-194

LAX TO HNL DEPARTURE 19 JUN 79
TAPE VL31, FILE 1, FLT 51

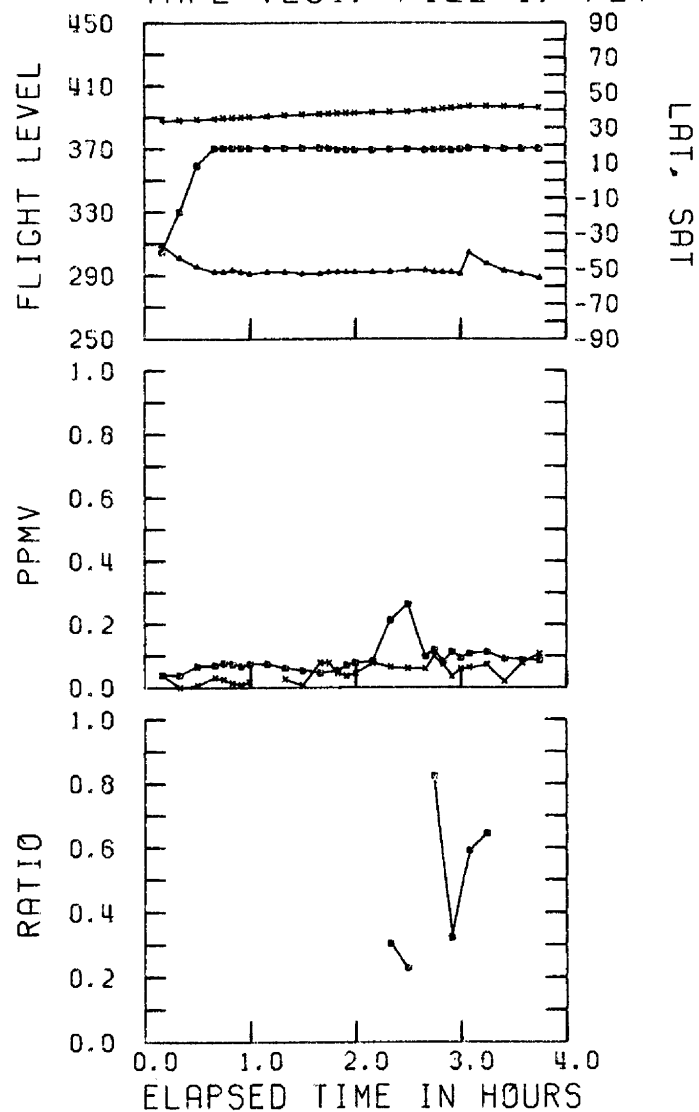


HNL TO LAX DEPARTURE 20 JUN 79
TAPE VL31, FILE 1, FLT 52

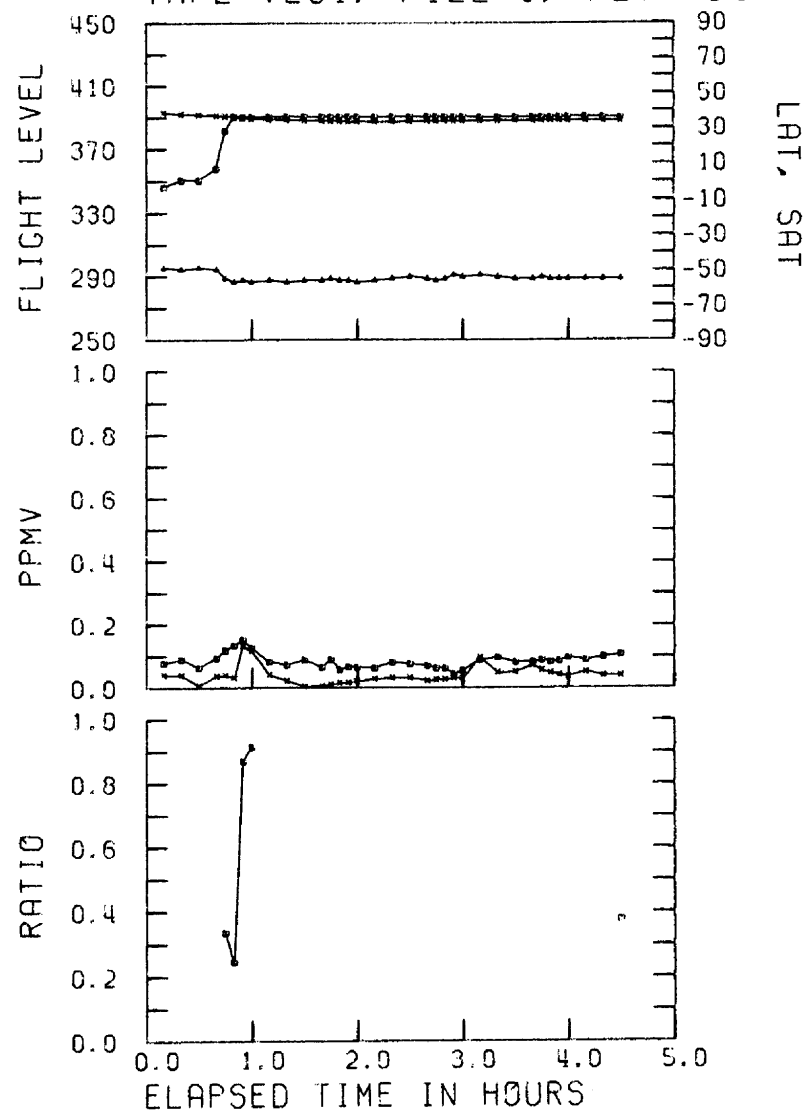


561-C

LAX TO JFK DEPARTURE 20 JUN 79
TAPE VL31, FILE 1, FLT 53

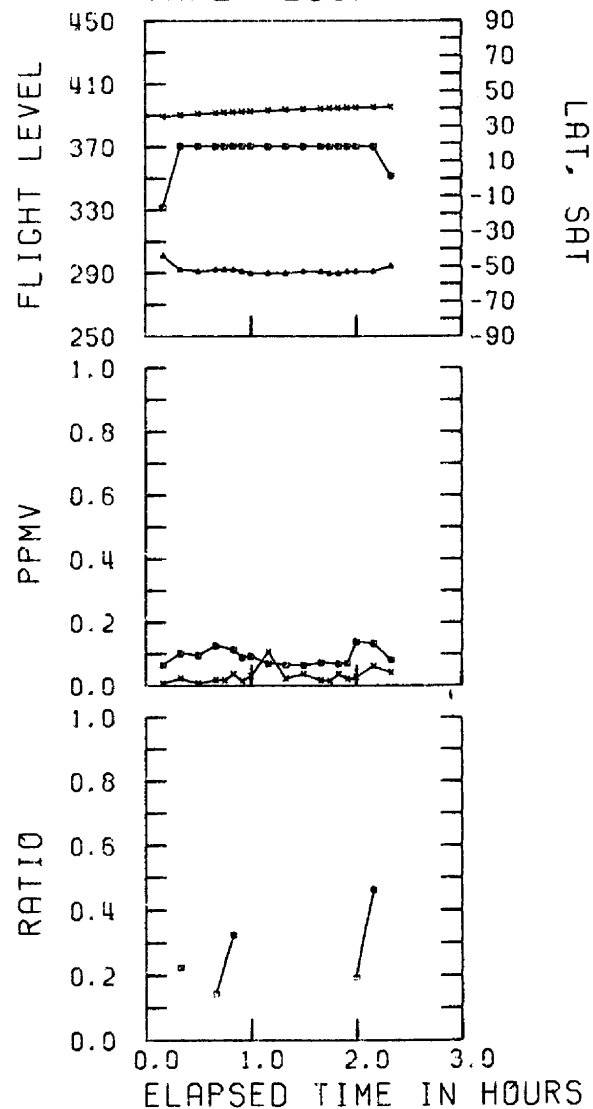


JFK TO LAX DEPARTURE 21 JUN 79
TAPE VL31, FILE 1, FLT 54

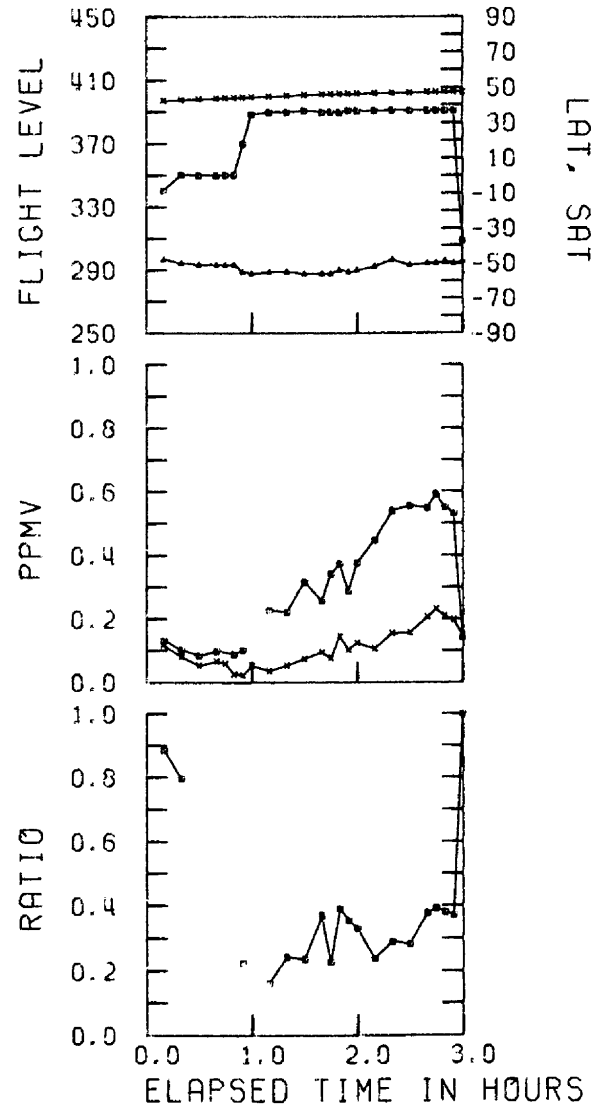


961-C

LAX TO ORD DEPARTURE 21 JUN 79
TAPE VL31, FILE 1, FLT 55

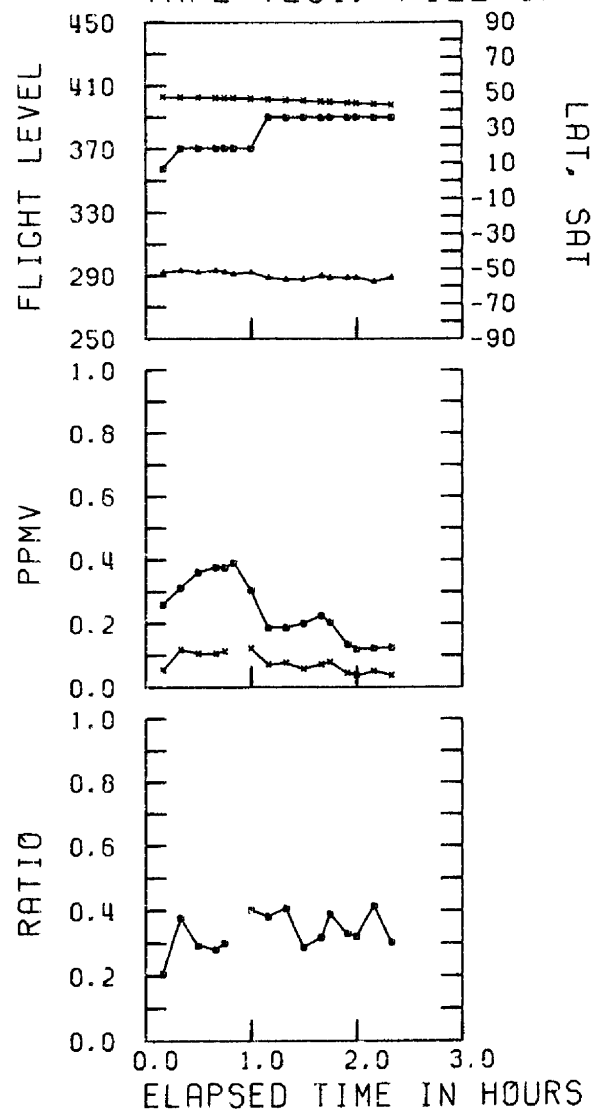


ORD TO SEA DEPARTURE 22 JUN 79
TAPE VL31, FILE 1, FLT 56

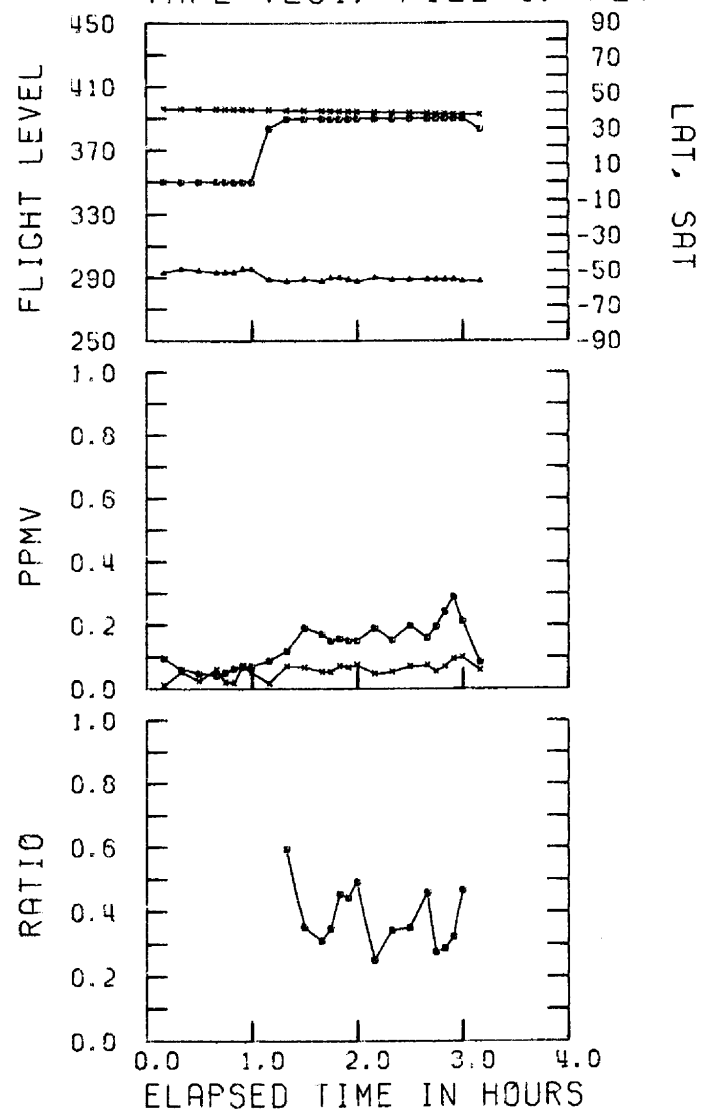


C-197

SEA TO ORD DEPARTURE 22 JUN 79
TAPE VL31, FILE 1, FLT 57

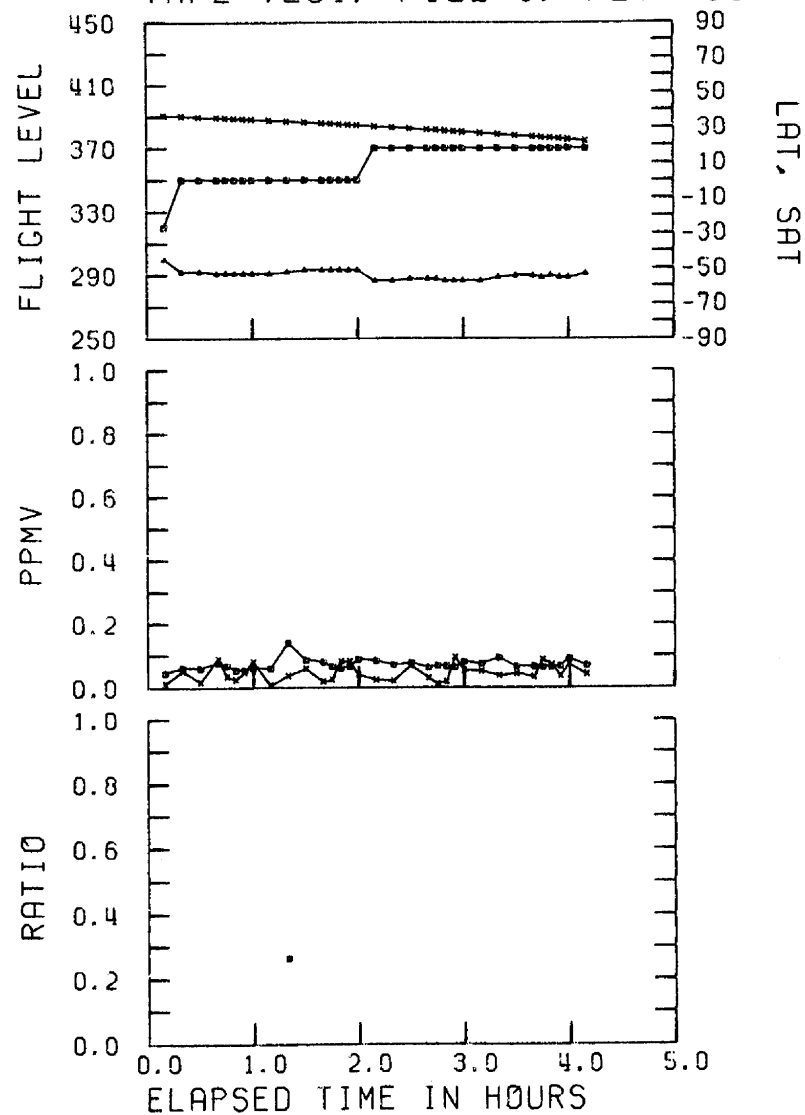


ORD TO SFO DEPARTURE 22 JUN 79
TAPE VL31, FILE 1, FLT 58

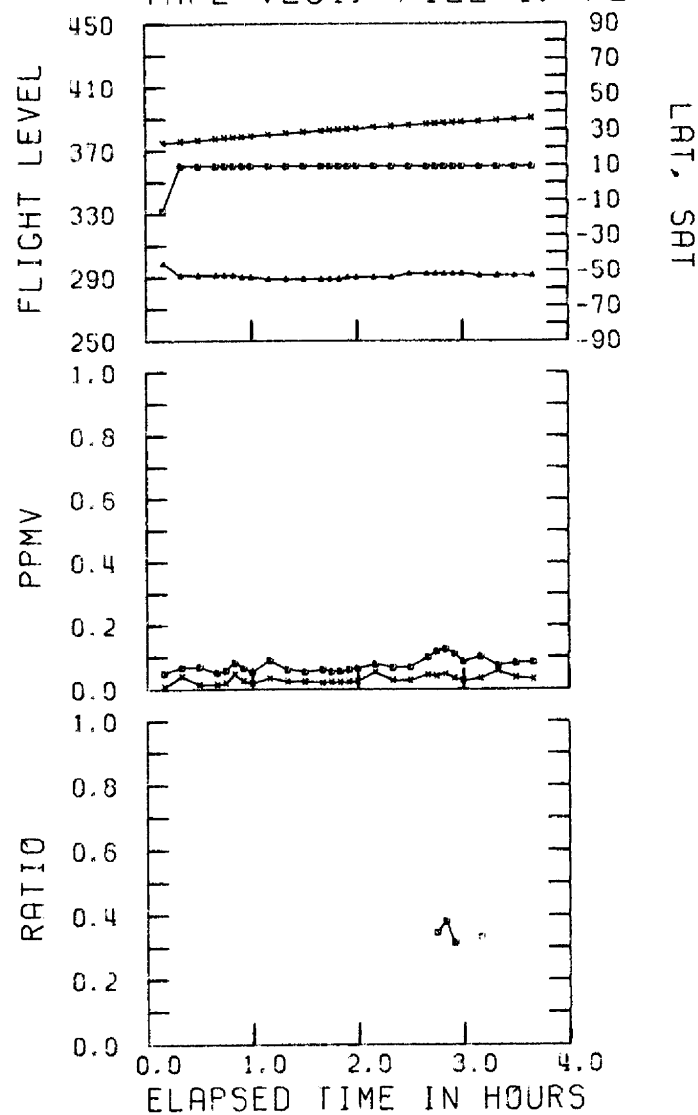


86T-C

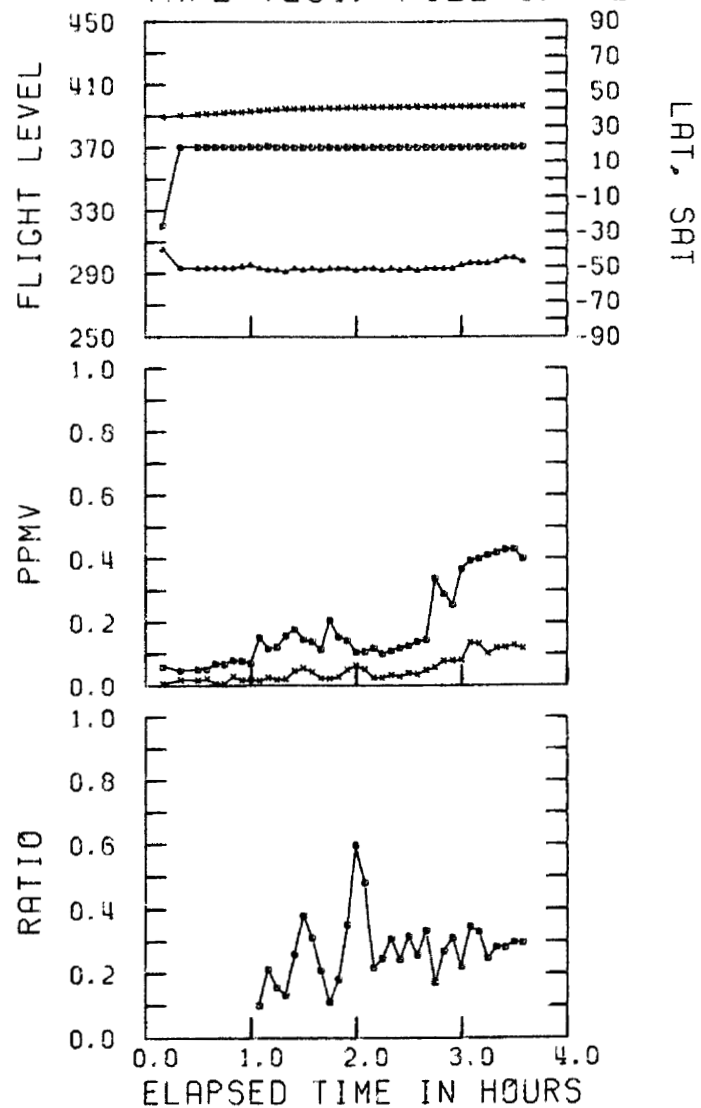
SFO TO HNL DEPARTURE 22 JUN 79
TAPE VL31, FILE 1, FLT 59



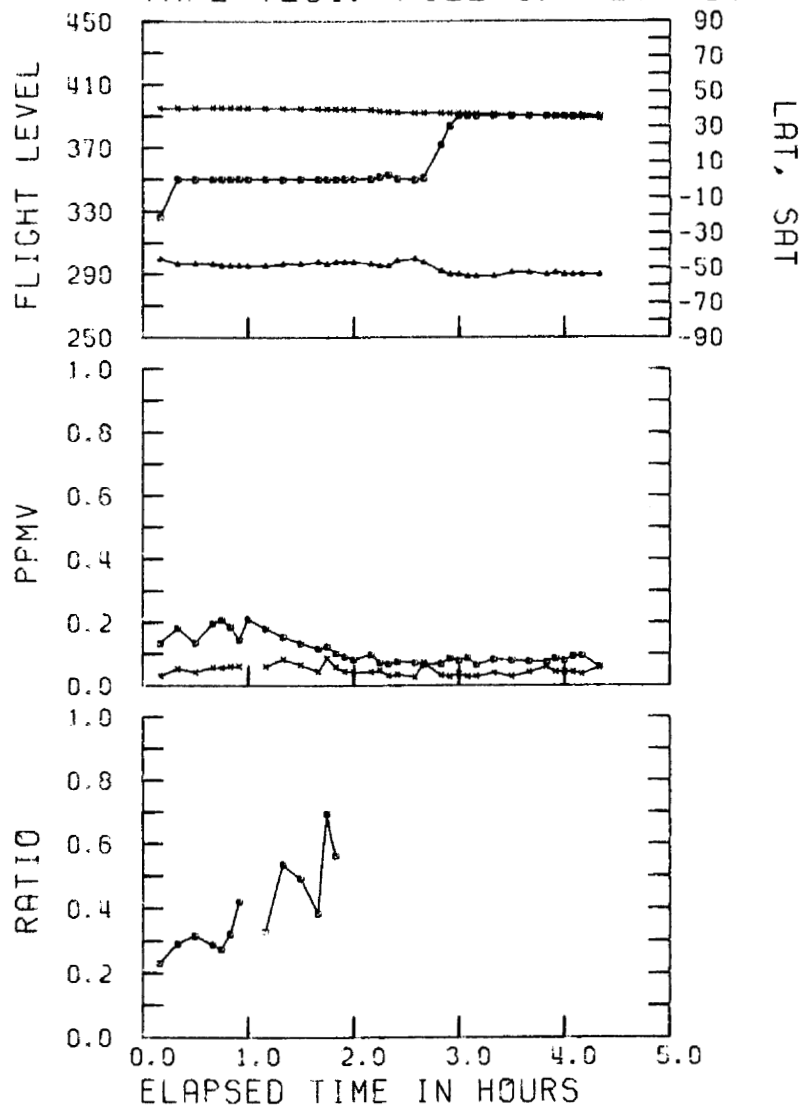
HNL TO SFO DEPARTURE 23 JUN 79
TAPE VL31, FILE 1, FLT 60



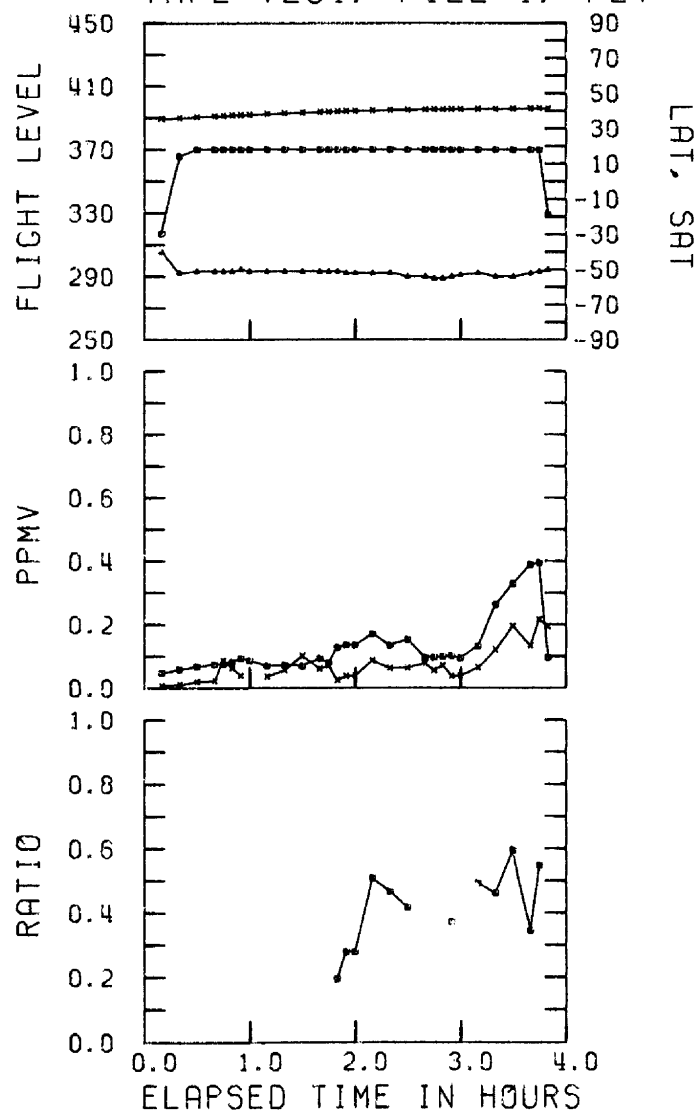
LAX TO JFK DEPARTURE 24 JUN 79
TAPE VL31, FILE 1, FLT 61



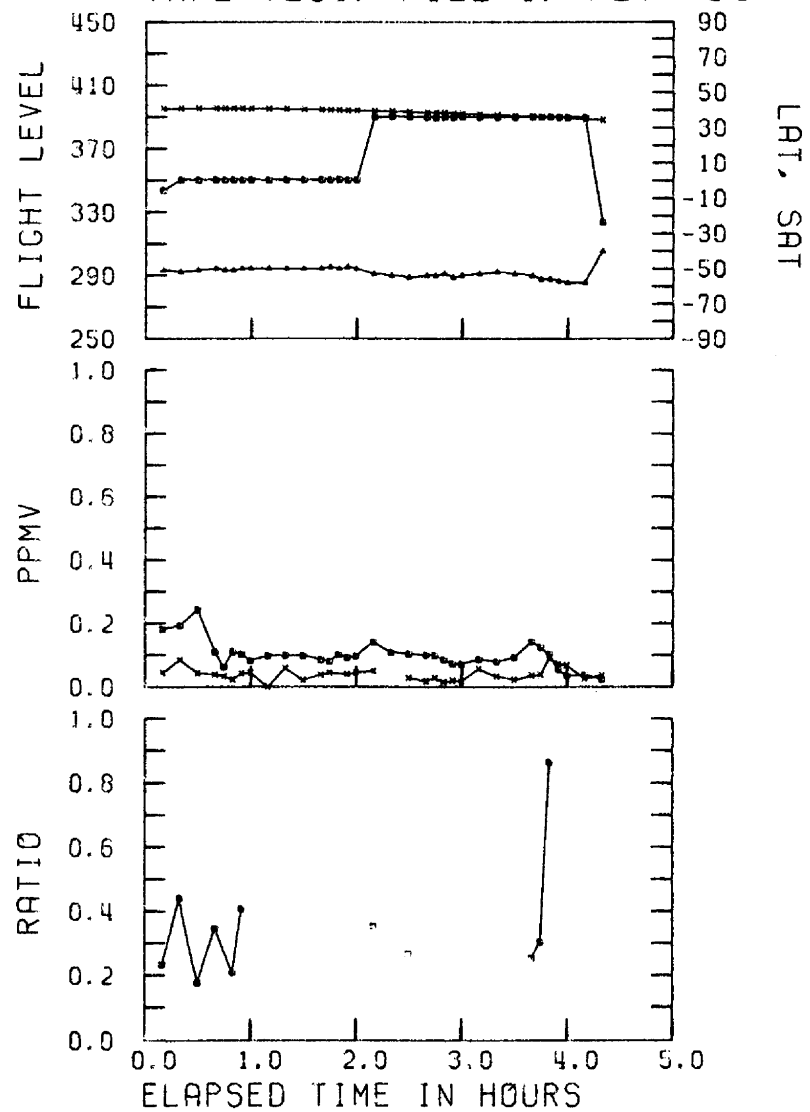
JFK TO LAX DEPARTURE 25 JUN 79
TAPE VL31, FILE 1, FLT 62



LAX TO JFK DEPARTURE 25 JUN 79
TAPE VL31, FILE 1, FLT 63

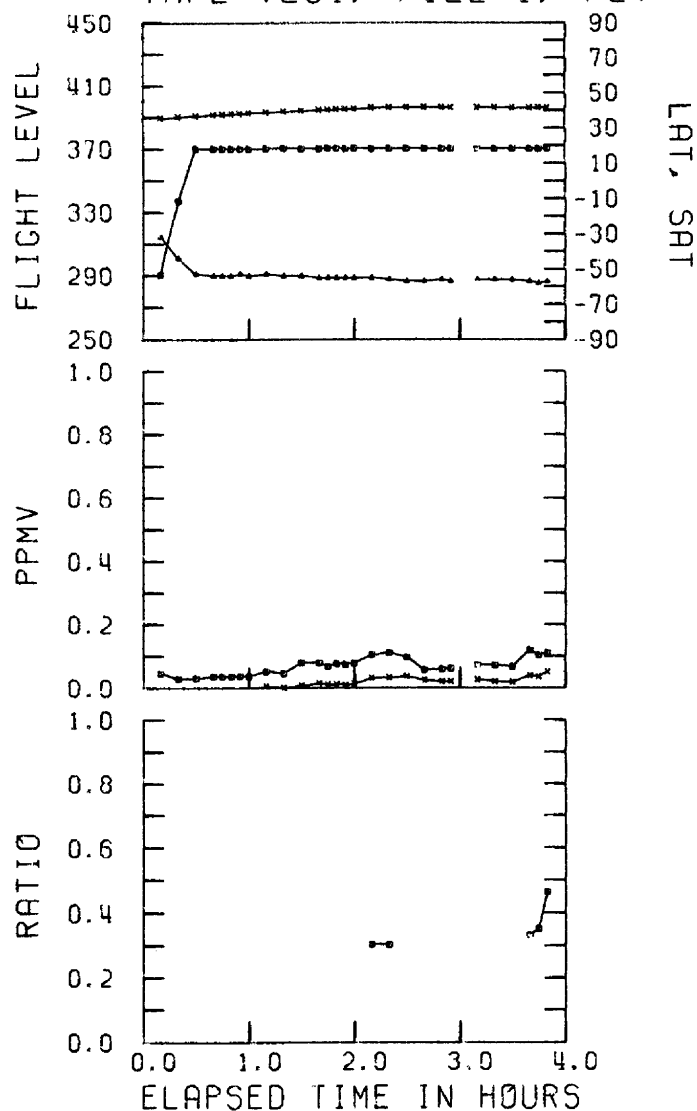


JFK TO LAX DEPARTURE 25 JUN 79
TAPE VL31, FILE 1, FLT 64

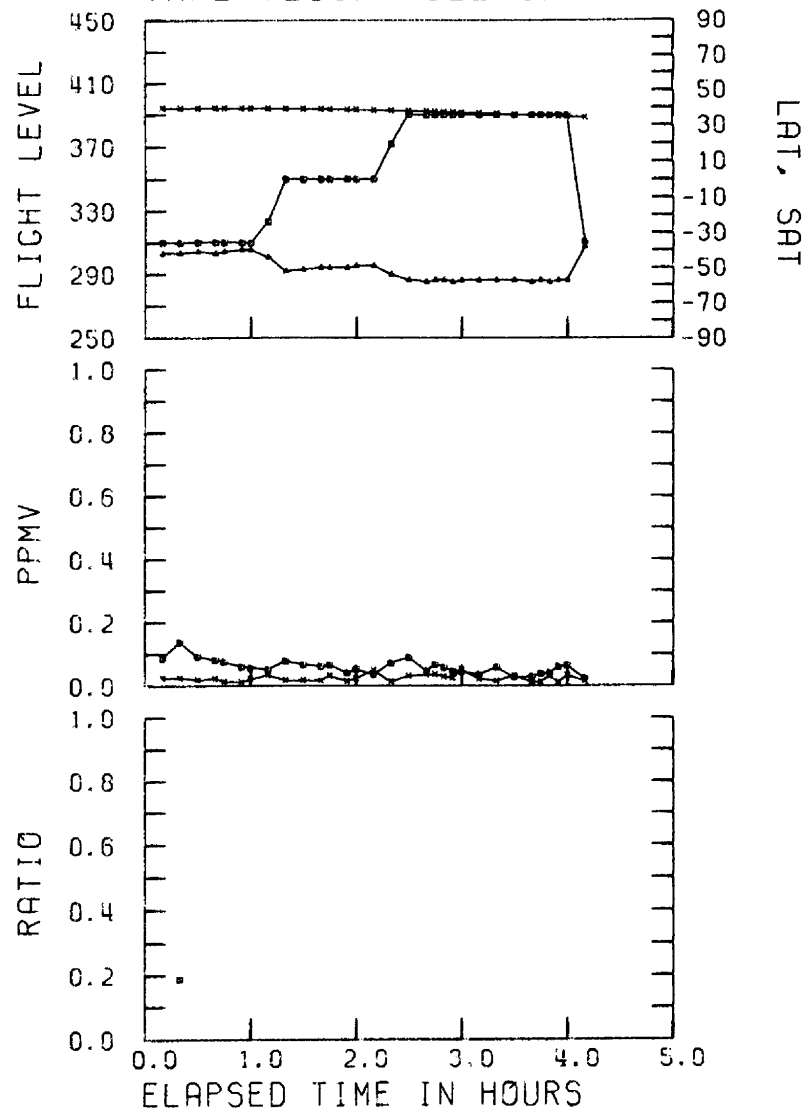


C-201

LAX TO JFK DEPARTURE 26 JUN 79
TAPE VL31, FILE 1, FLT 65

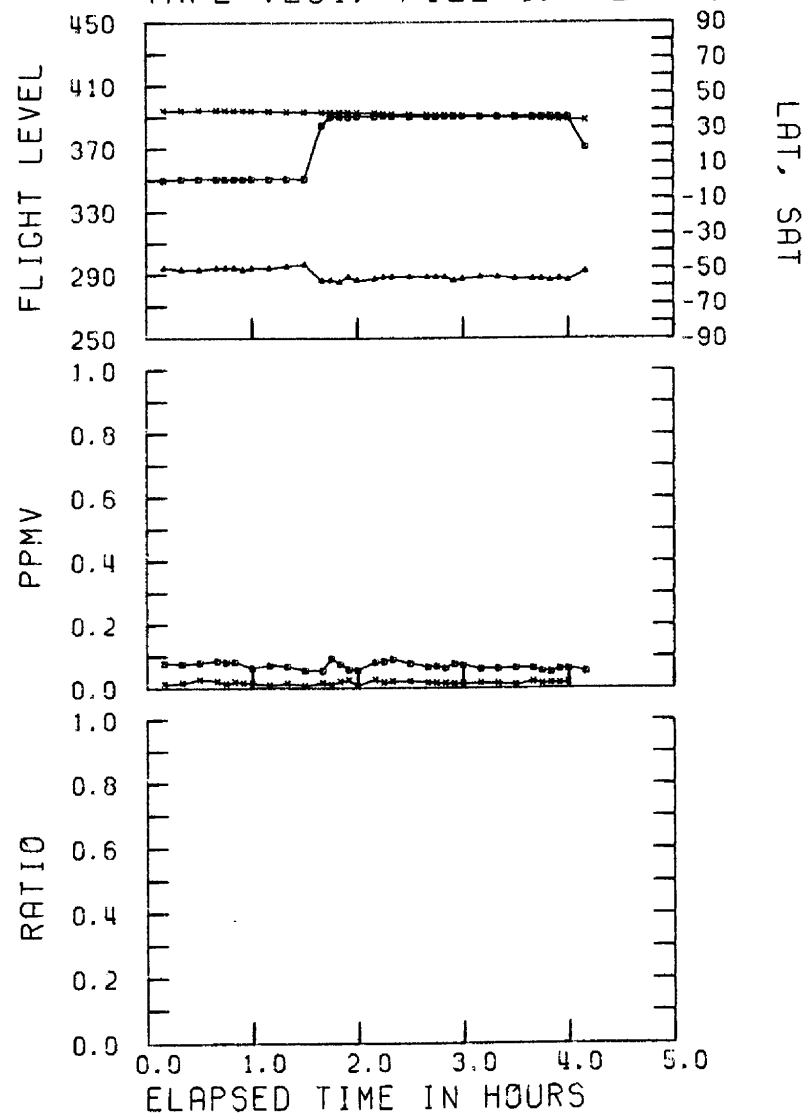


JFK TO LAX DEPARTURE 26 JUN 79
TAPE VL31, FILE 1, FLT 66

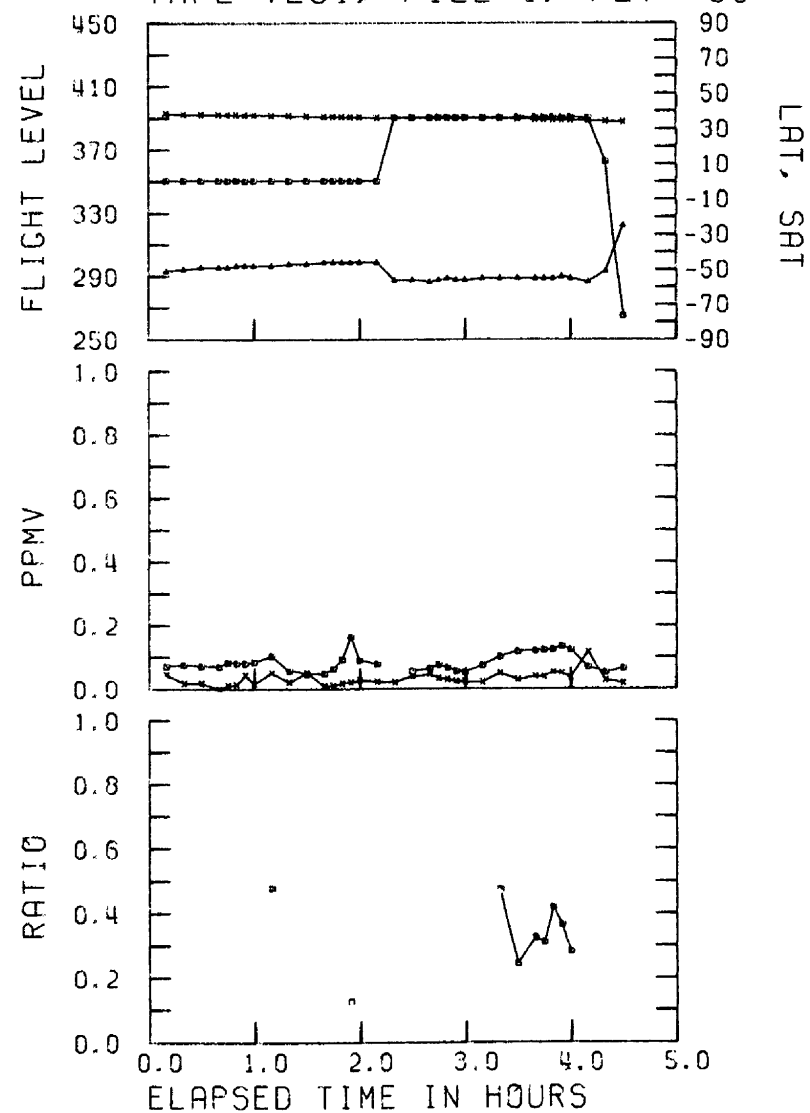


C-202

JFK TO LAX DEPARTURE 28 JUN 79
TAPE VL31, FILE 1, FLT 68

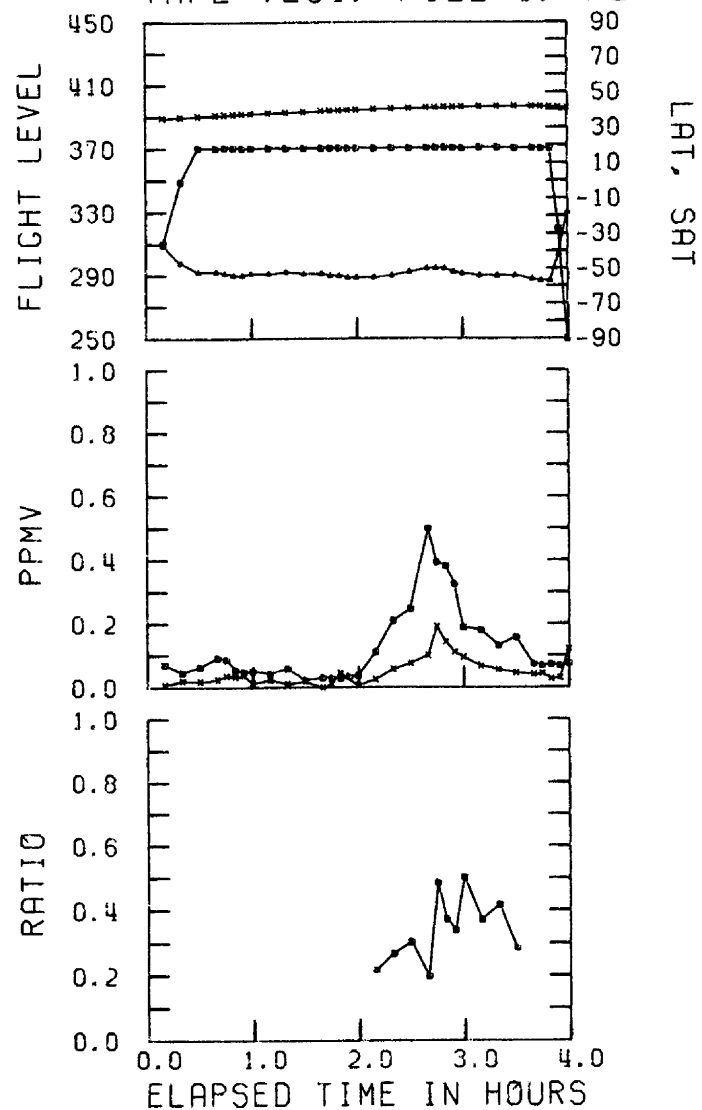


JFK TO LAX DEPARTURE 29 JUN 79
TAPE VL31, FILE 1, FLT 69

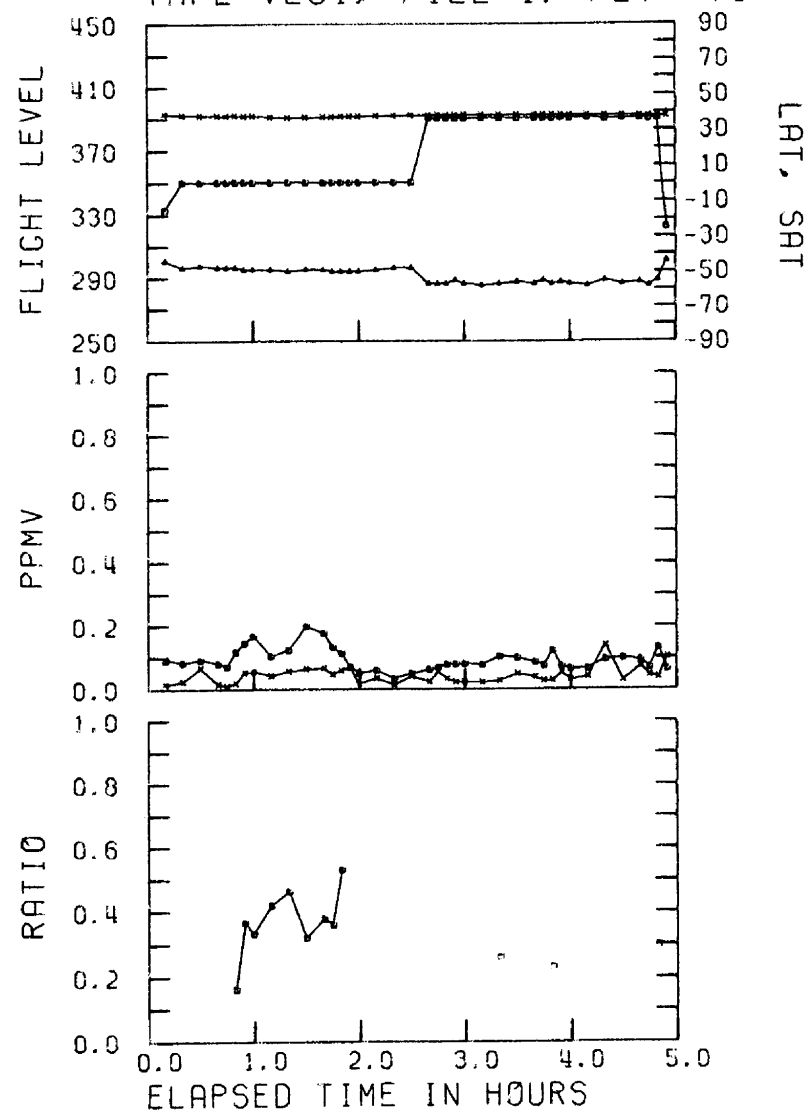


C-203

LAX TO JFK DEPARTURE 29 JUN 79
TAPE VL31, FILE 1, FLT 70

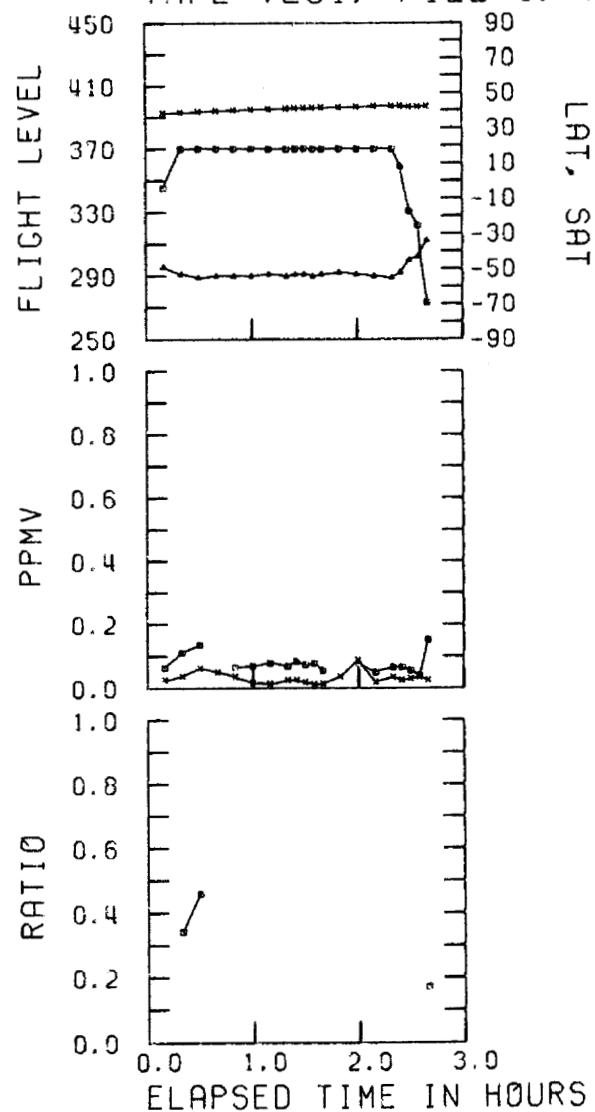


JFK TO SFO DEPARTURE 29 JUN 79
TAPE VL31, FILE 1, FLT 71

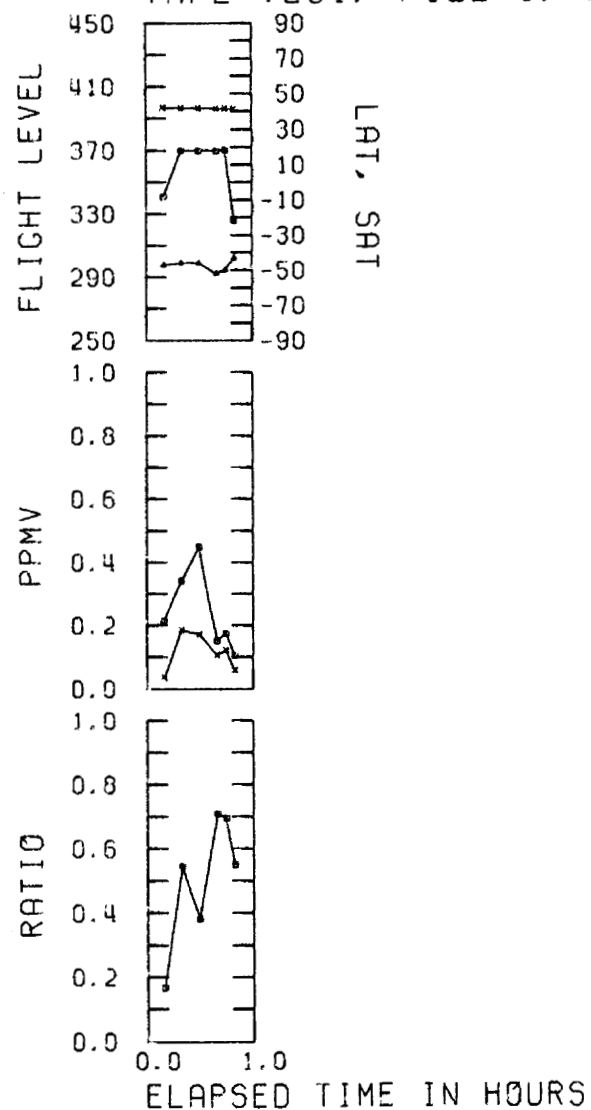


C-204

SFO TO ORD DEPARTURE 30 JUN 79
TAPE VL31, FILE 1, FLT 72

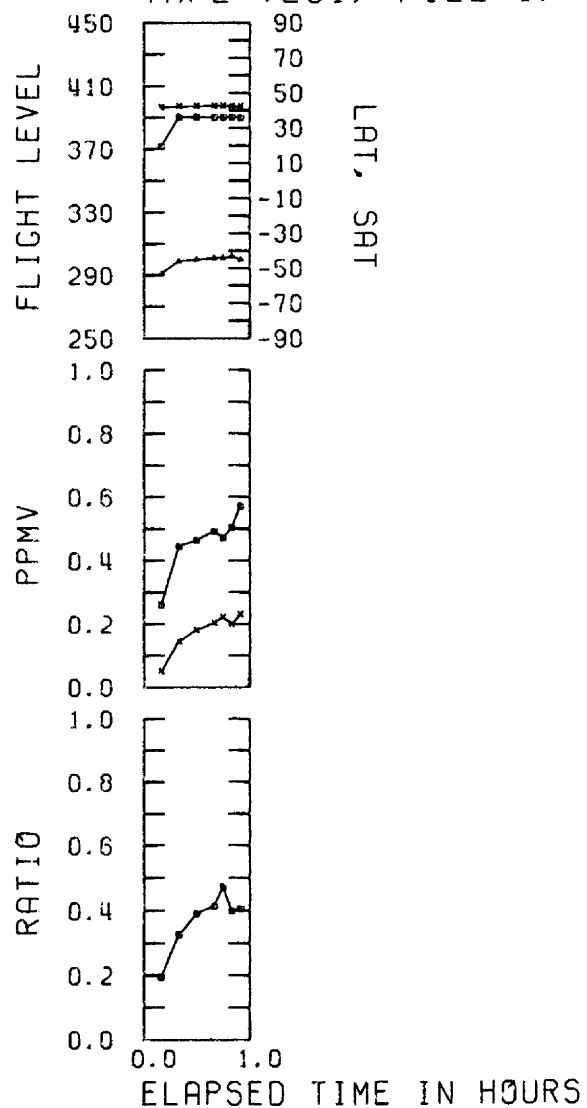


ORD TO JFK
DEPARTURE 1 JUL 79
TAPE VL31, FILE 1, FLT 73

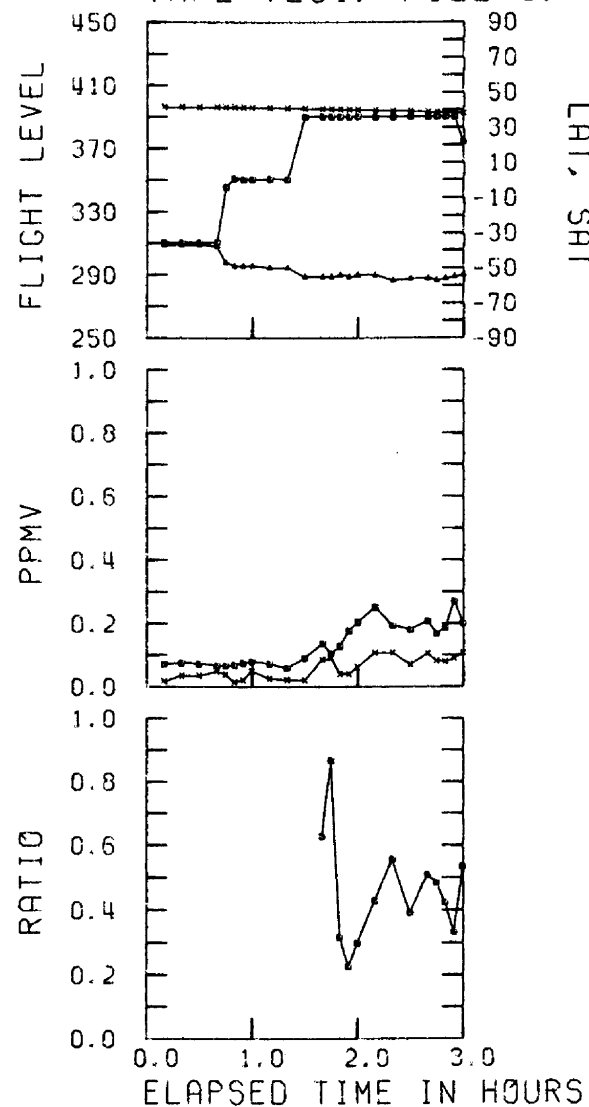


C-205

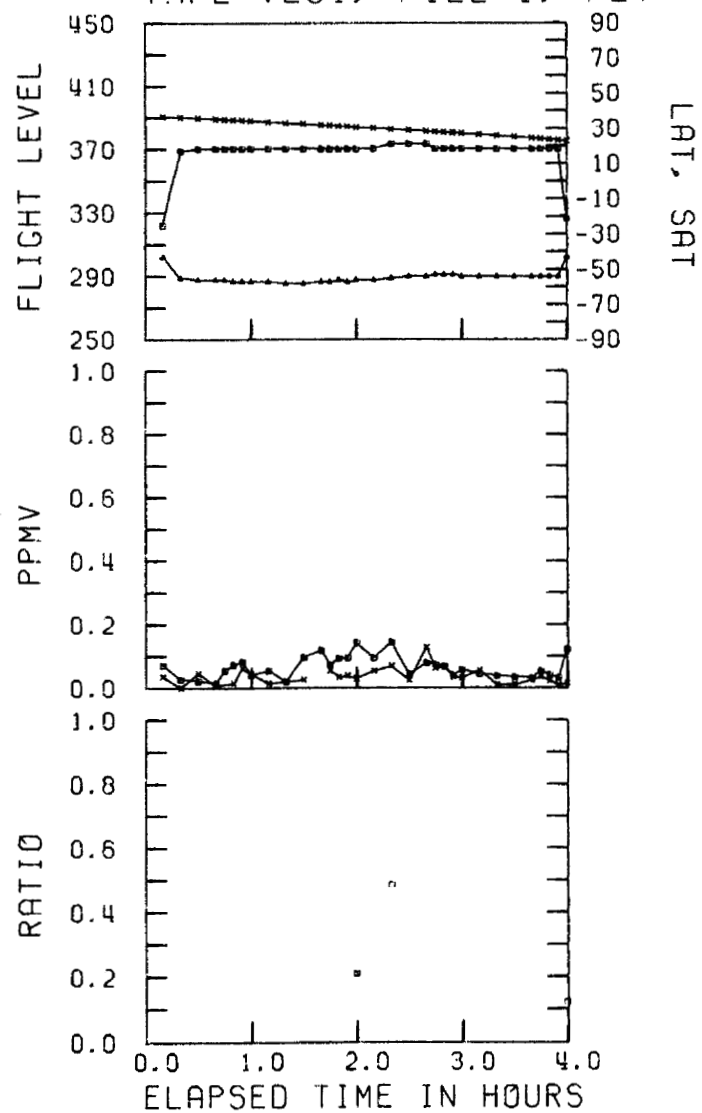
JFK TO ORD DEPARTURE 1 JUL 79
TAPE VL31, FILE 1, FLT 74



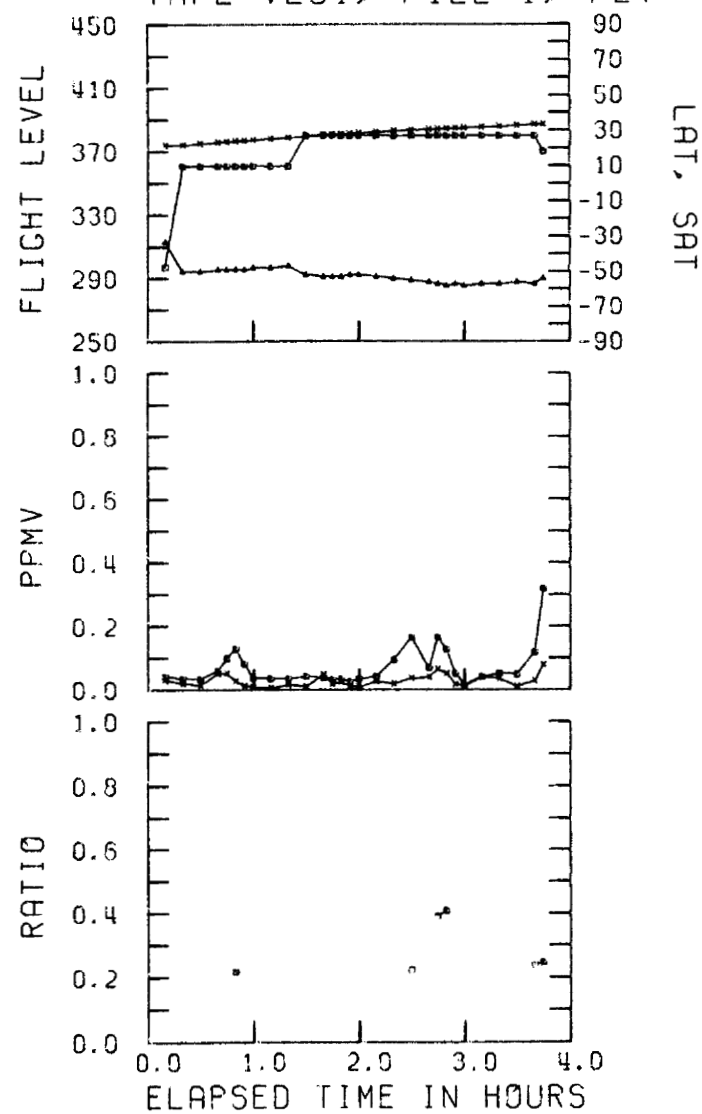
ORD TO SFO DEPARTURE 1 JUL 79
TAPE VL31, FILE 1, FLT 75



SFO TO HNL DEPARTURE 1 JUL 79
TAPE VL31, FILE 1, FLT 76

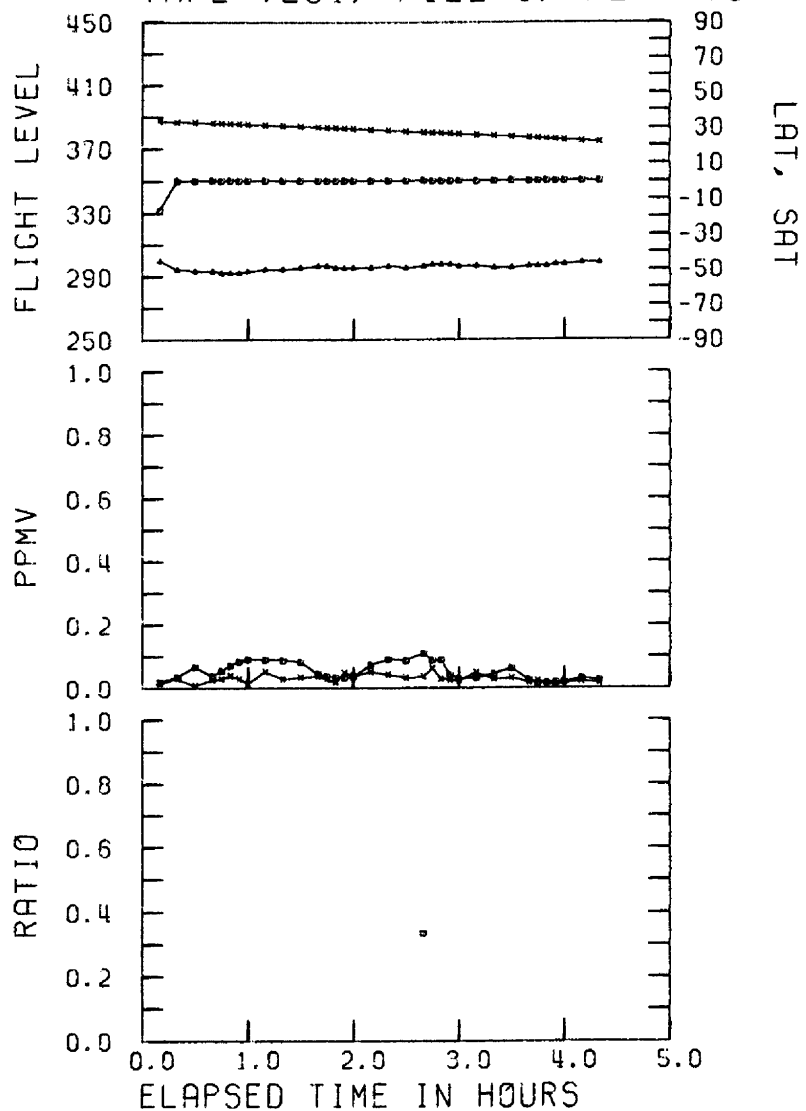


HNL TO LAX DEPARTURE 2 JUL 79
TAPE VL31, FILE 1, FLT 77

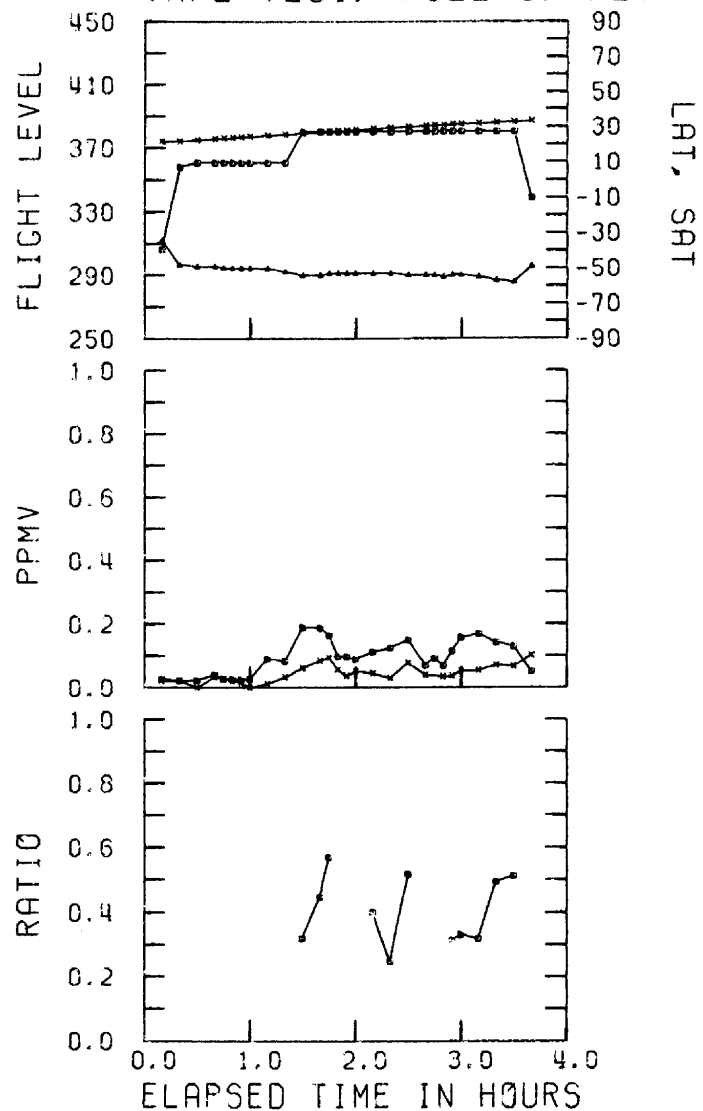


C-207

LAX TO HNL DEPARTURE 3 JUL 79
TAPE VL31, FILE 1, FLT 78

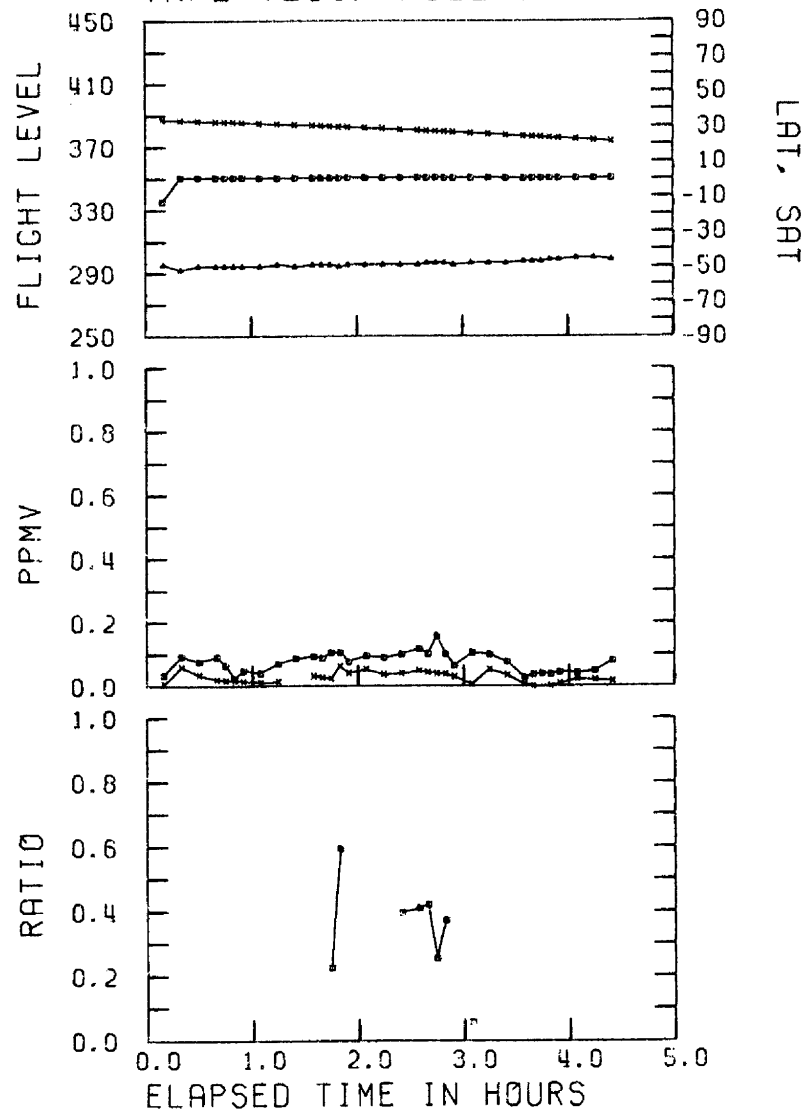


HNL TO LAX DEPARTURE 3 JUL 79
TAPE VL31, FILE 1, FLT 79

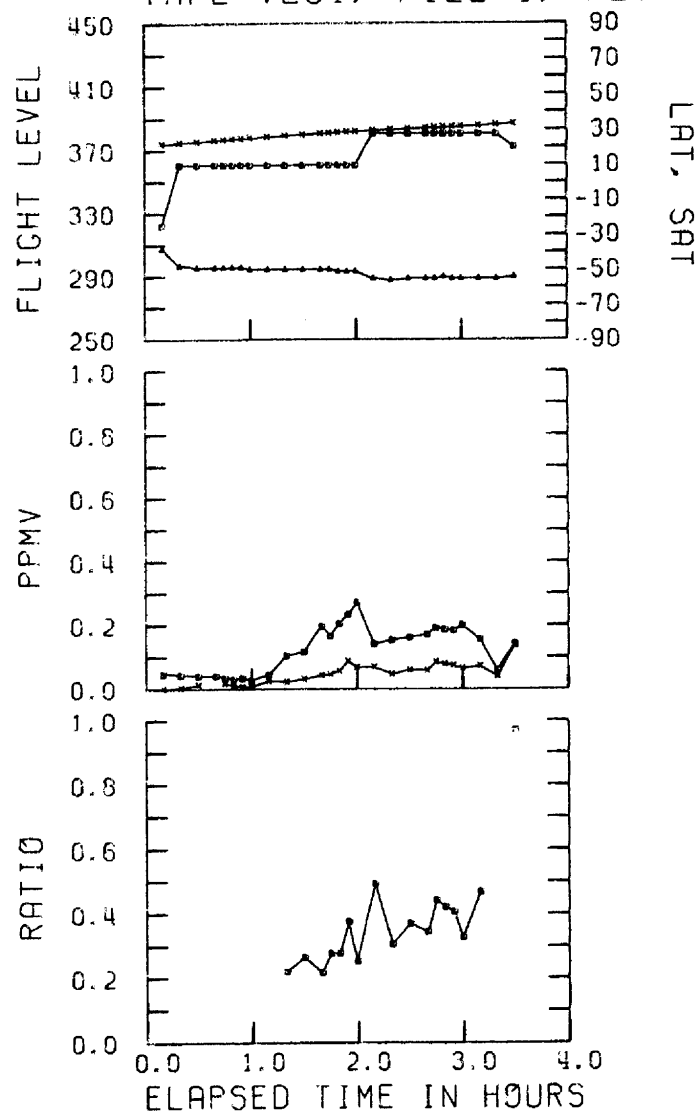


C-208

LAX TO HNL DEPARTURE 3 JUL 79
TAPE VL31, FILE 1, FLT 80

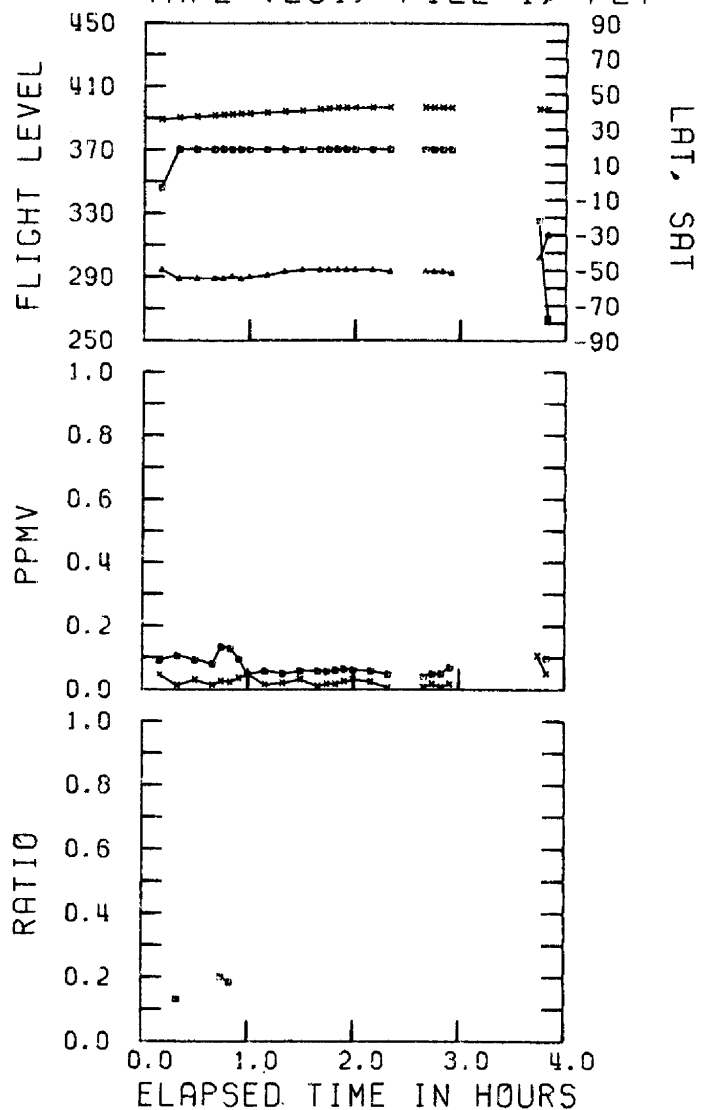


ITO TO LAX DEPARTURE 4 JUL 79
TAPE VL31, FILE 1, FLT 82

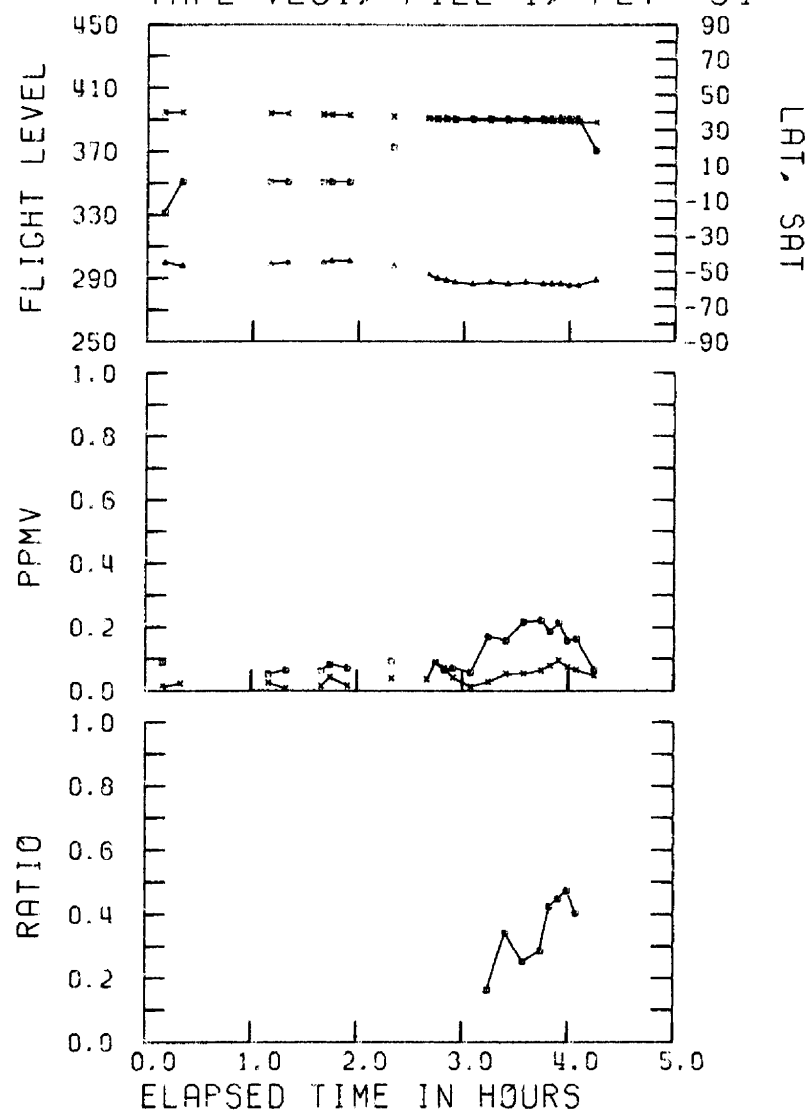


C-209

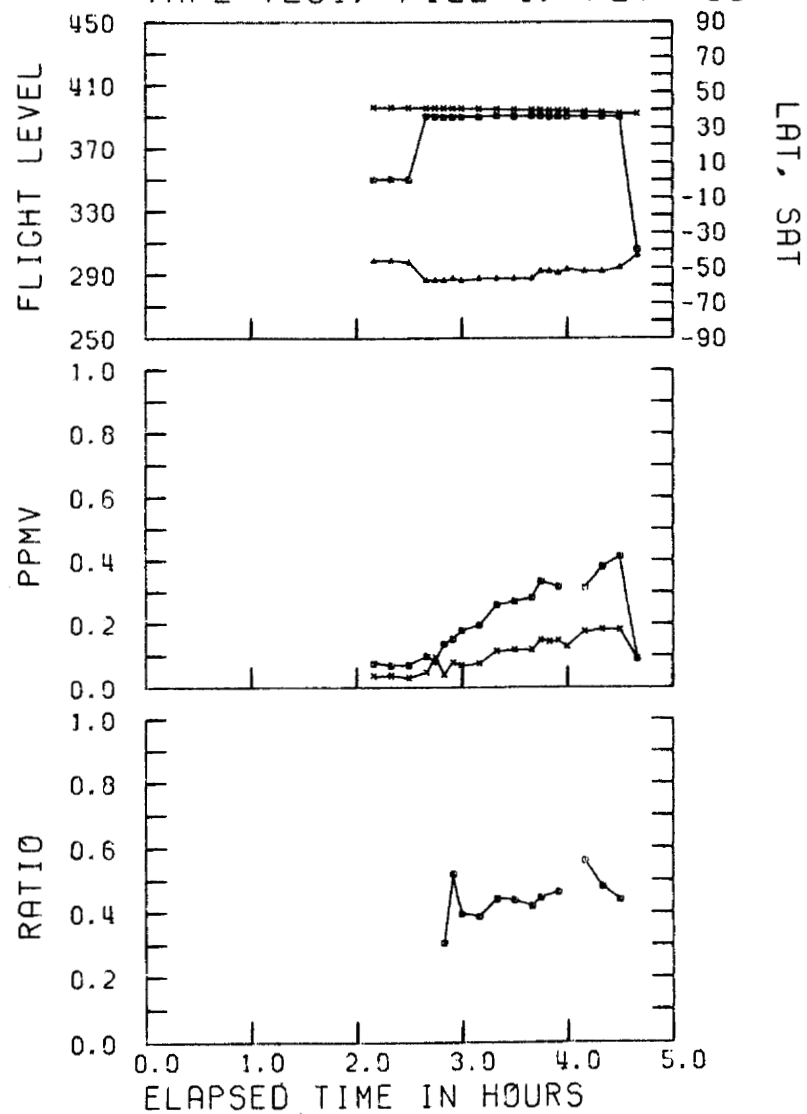
LAX TO JFK DEPARTURE 4 JUL 79
TAPE VL31, FILE 1, FLT 83



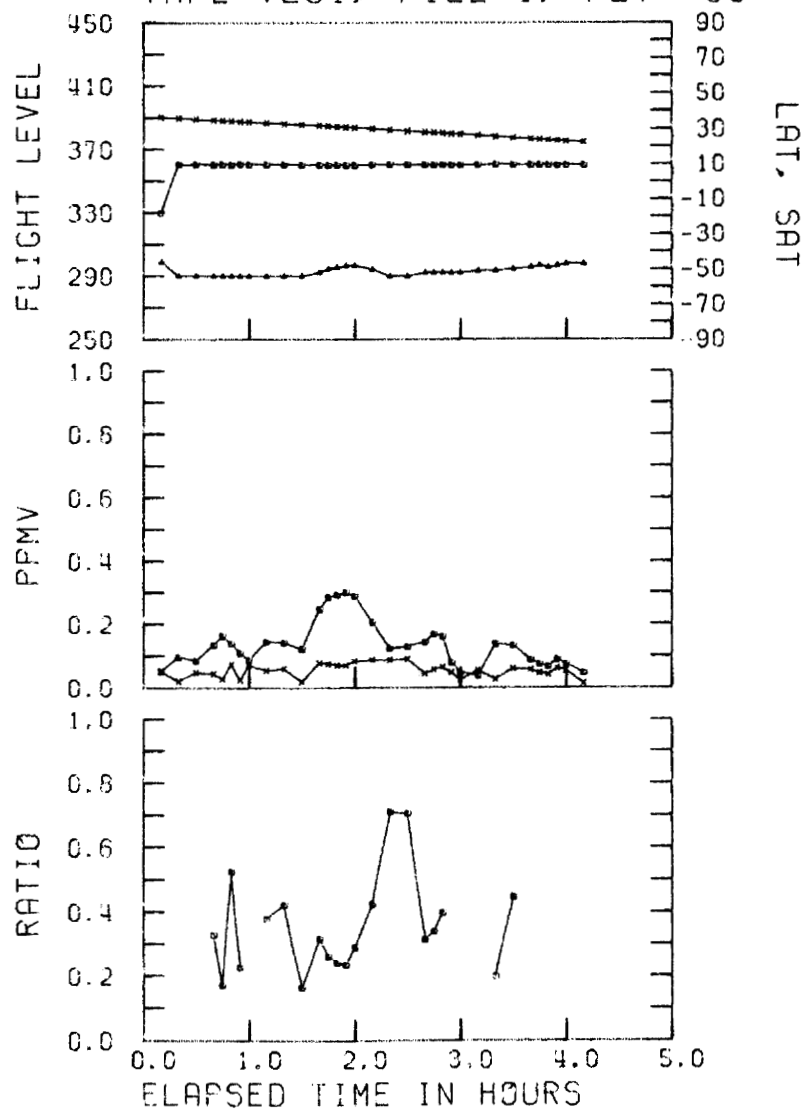
JFK TO LAX DEPARTURE 4 JUL 79
TAPE VL31, FILE 1, FLT 84



JFK TO SFO DEPARTURE 5 JUL 79
TAPE VL31, FILE 1, FLT 85

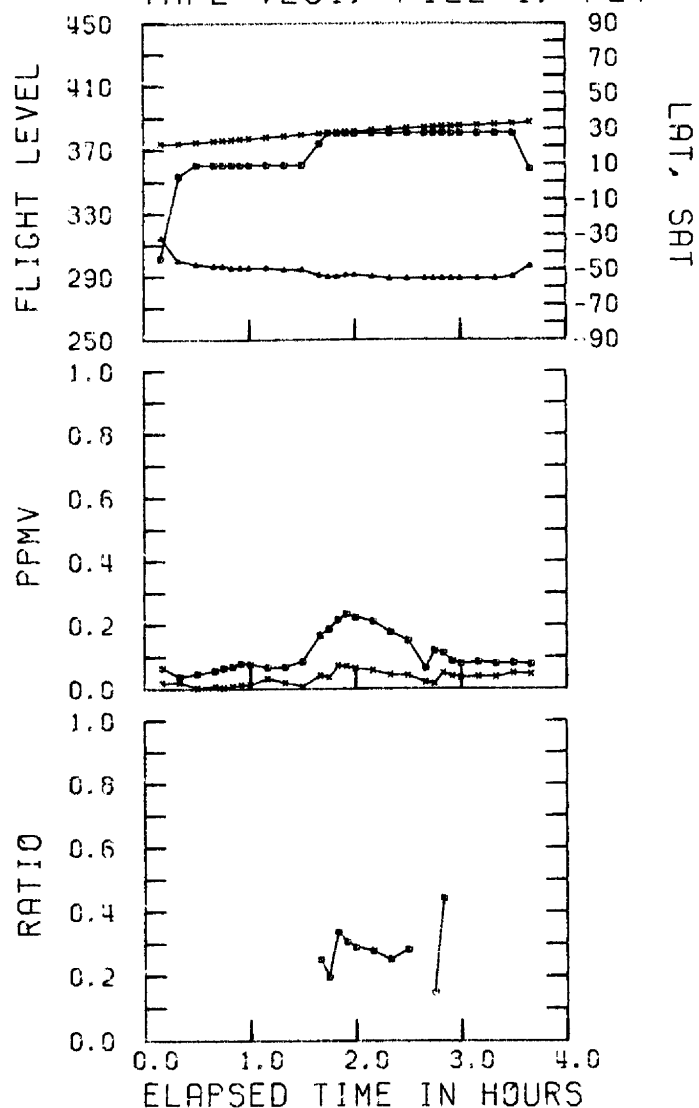


SFO TO HNL DEPARTURE 6 JUL 79
TAPE VL31, FILE 1, FLT 86

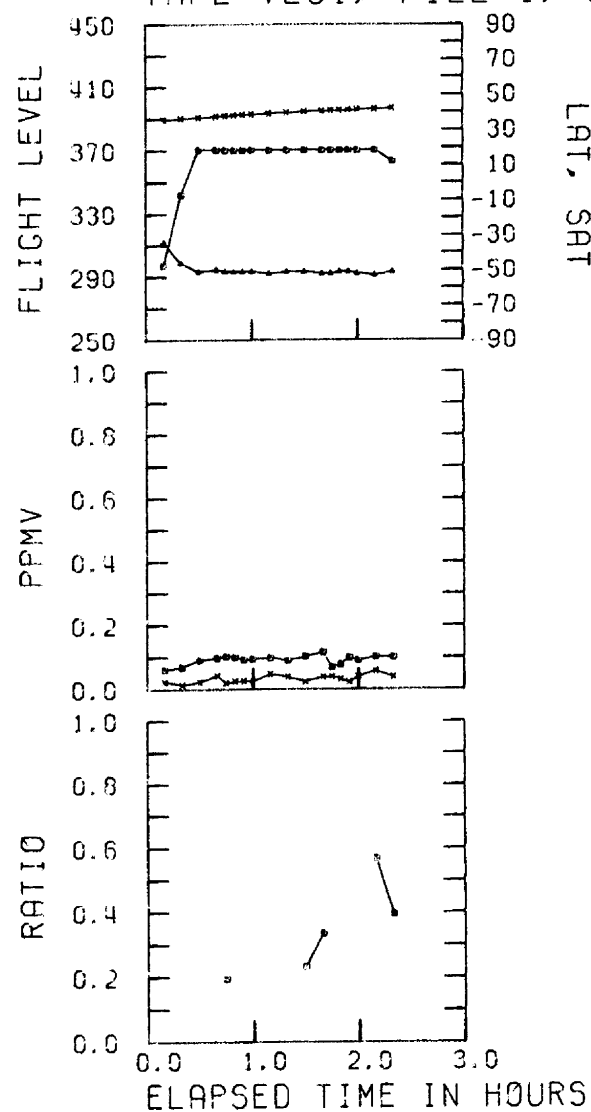


C-211

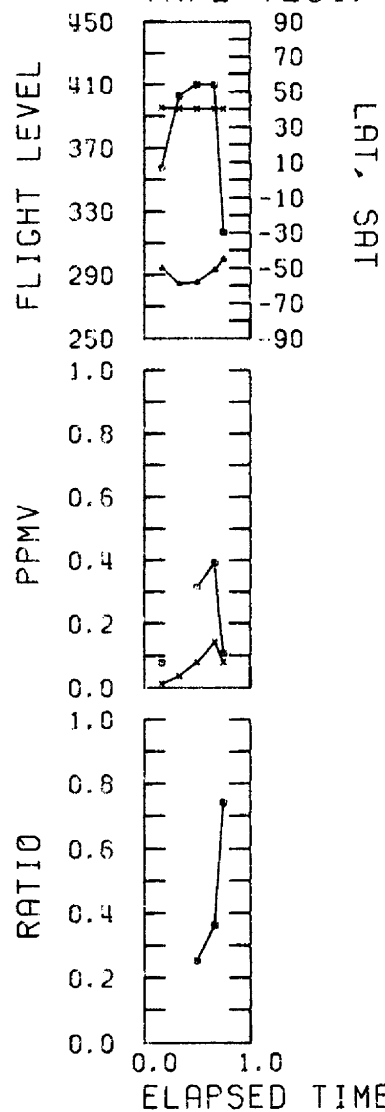
HNL TO LAX DEPARTURE 7 JUL 79
TAPE VL31, FILE 1, FLT 87



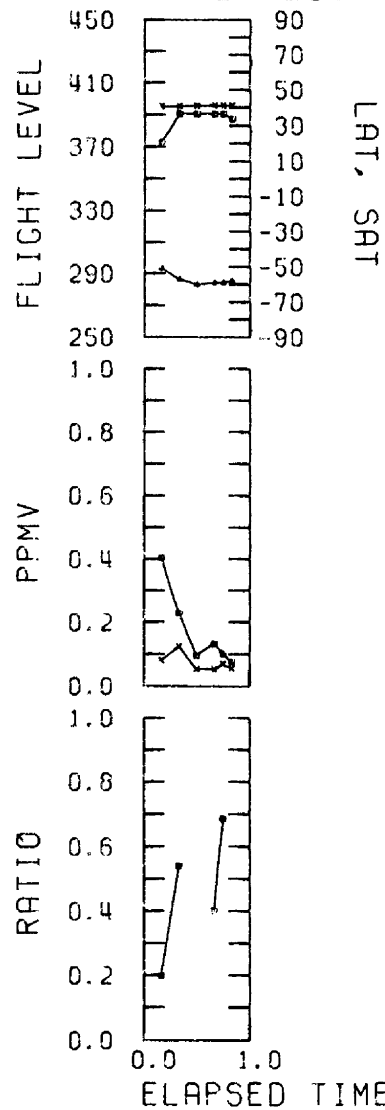
LAX TO ORD DEPARTURE 7 JUL 79
TAPE VL31, FILE 1, FLT 88



ORD TO PHL DEPARTURE 7 JUL 79
TAPE VL31, FILE 1, FLT 89

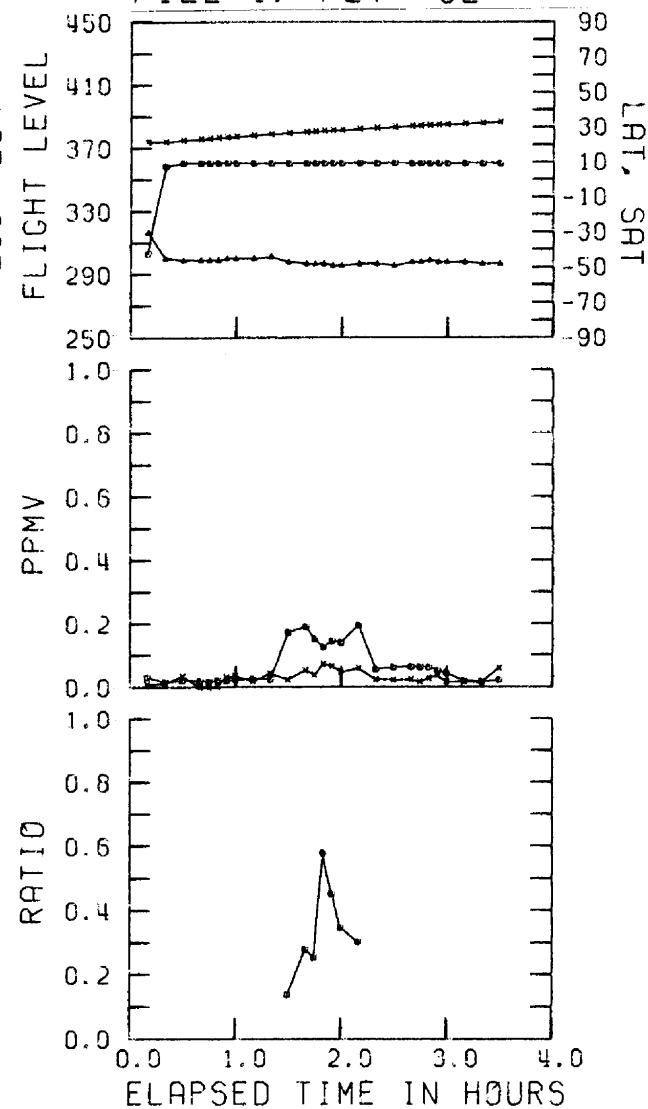
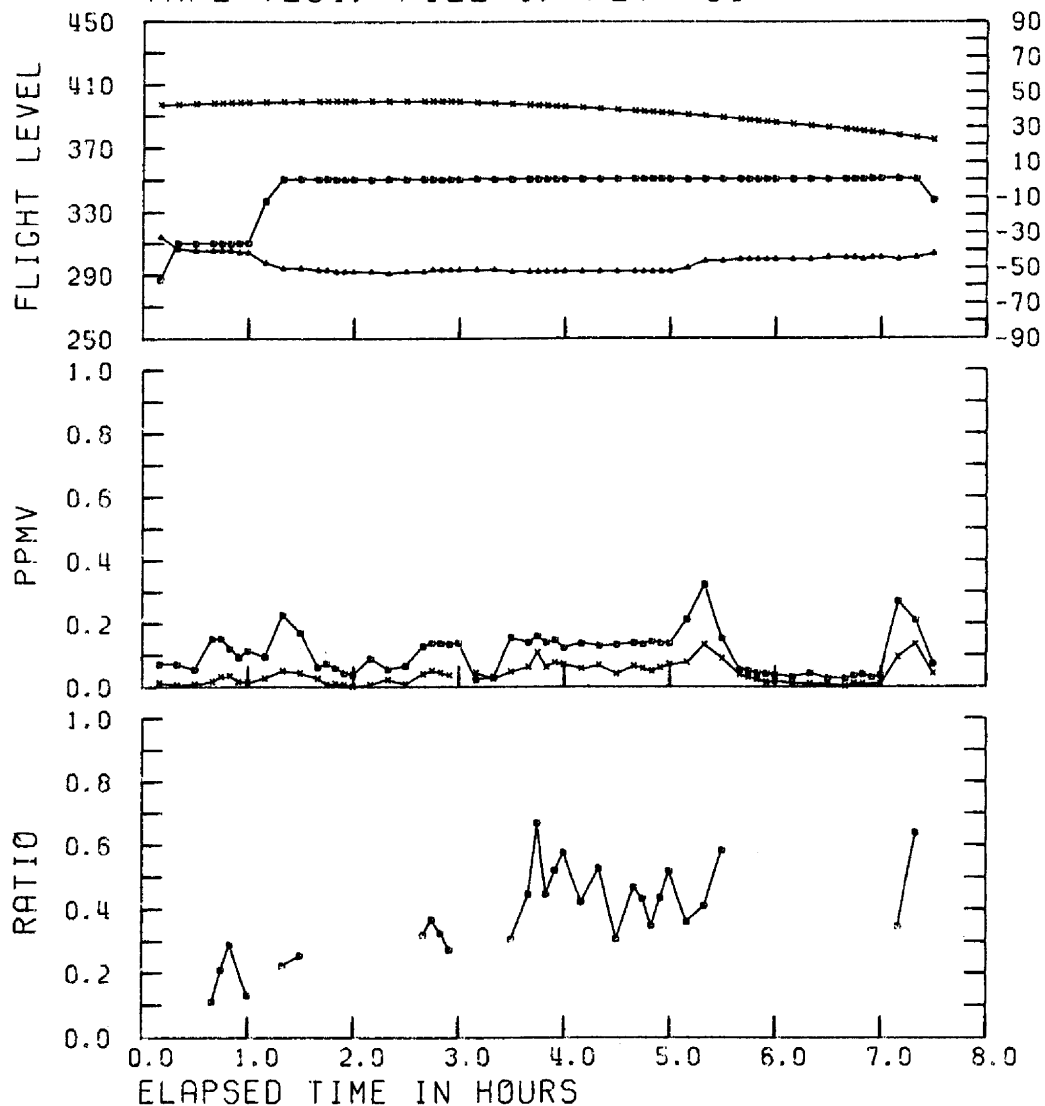


PHL TO ORD DEPARTURE 7 JUL 79
TAPE VL31, FILE 1, FLT 90



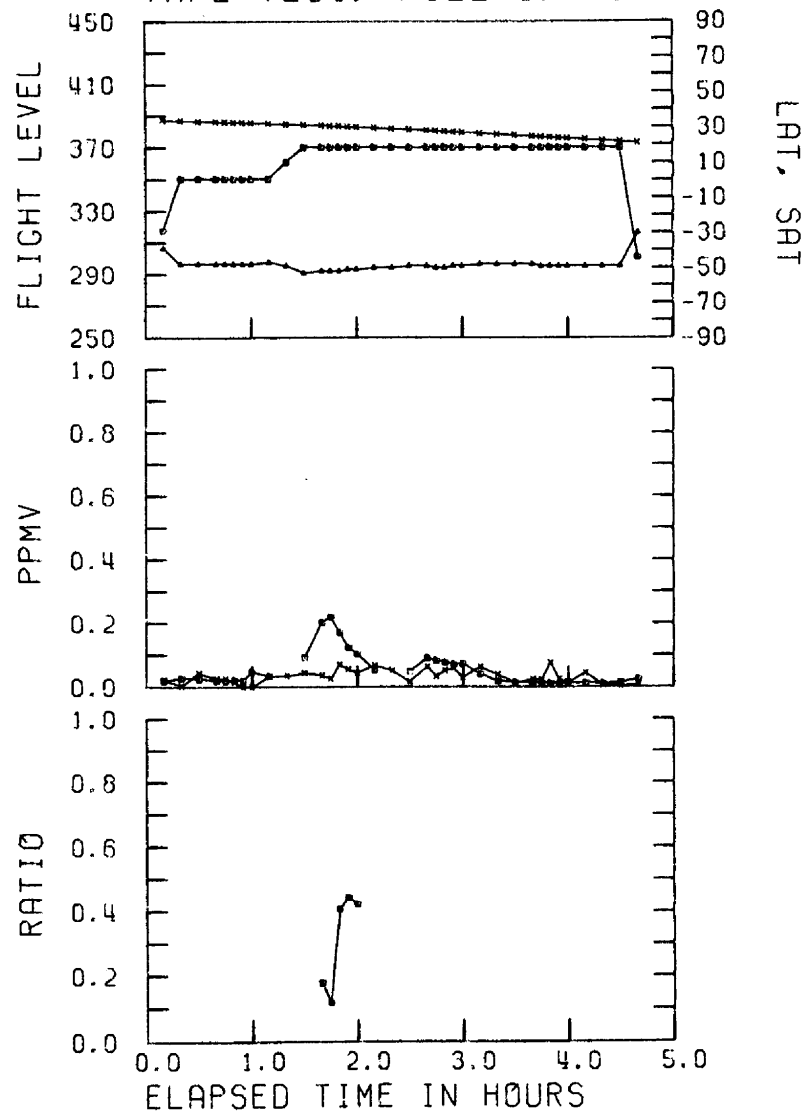
HNL TO LAX
 DEPARTURE 8 JUL 79
 TAPE VL31,
 FILE 1, FLT 92

ORD TO HNL DEPARTURE 7 JUL 79
 TAPE VL31, FILE 1, FLT 91

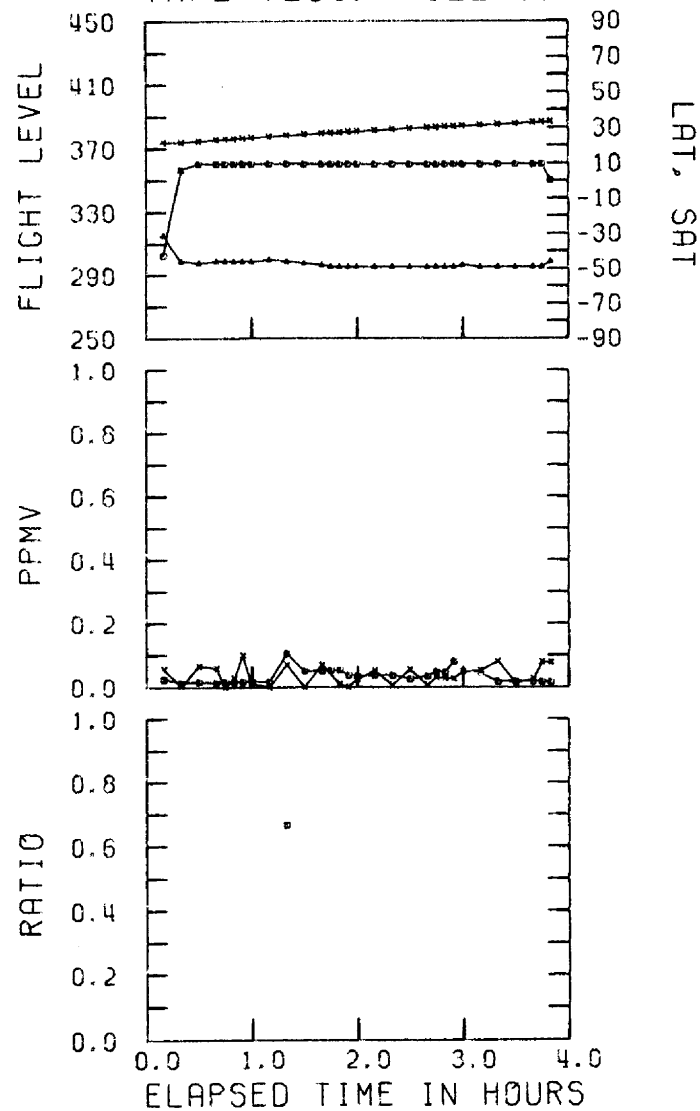


C-214

LAX TO HNL DEPARTURE 8 JUL 79
TAPE VL31, FILE 1, FLT 93

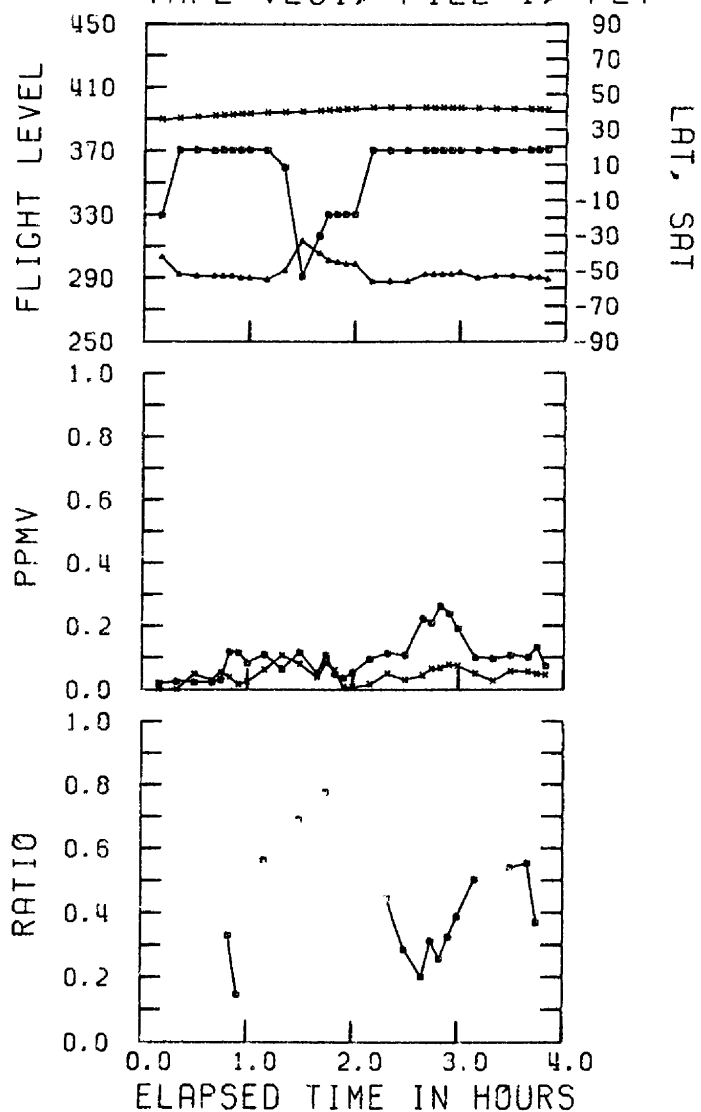


HNL TO LAX DEPARTURE 8 JUL 79
TAPE VL31, FILE 1, FLT 94

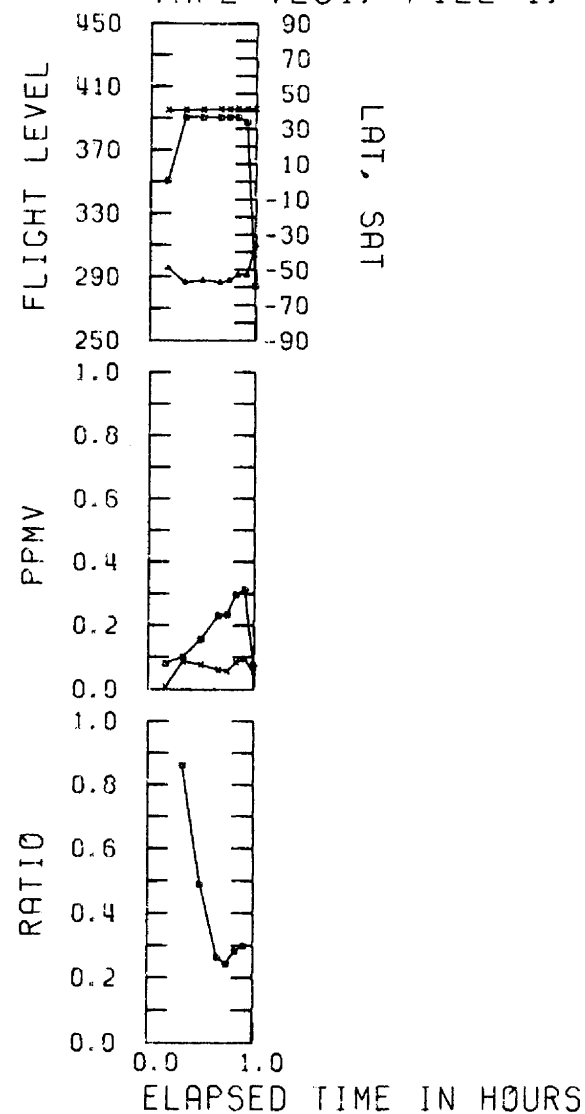


C-215

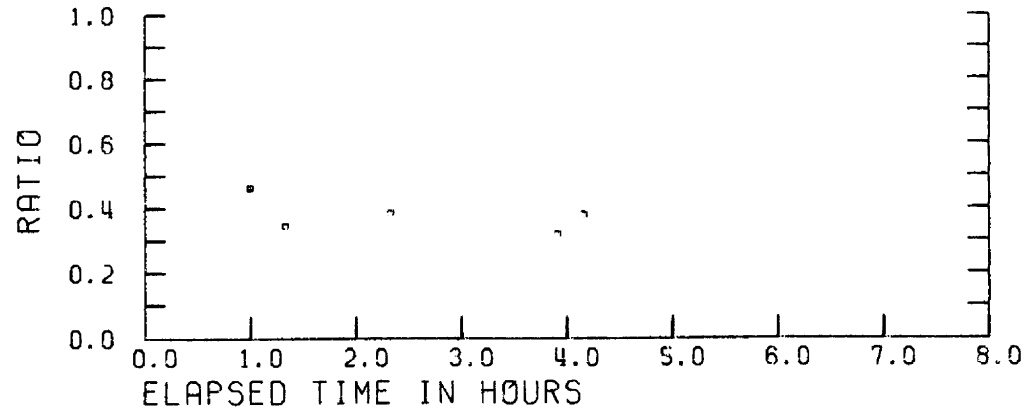
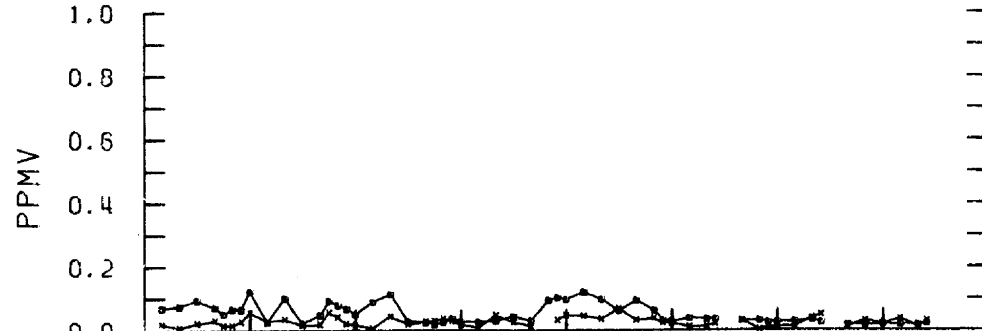
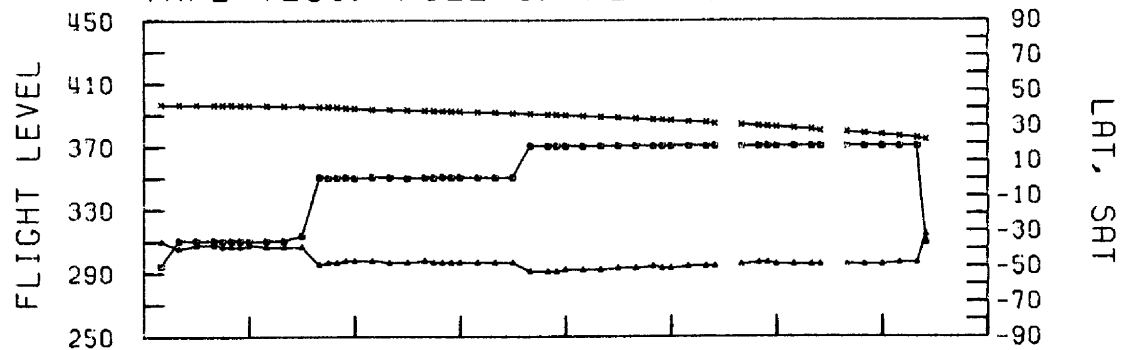
LAX TO JFK DEPARTURE 9 JUL 79
TAPE VL31, FILE 1, FLT 95



JFK TO ORD
DEPARTURE 9 JUL 79
TAPE VL31, FILE 1, FLT 96



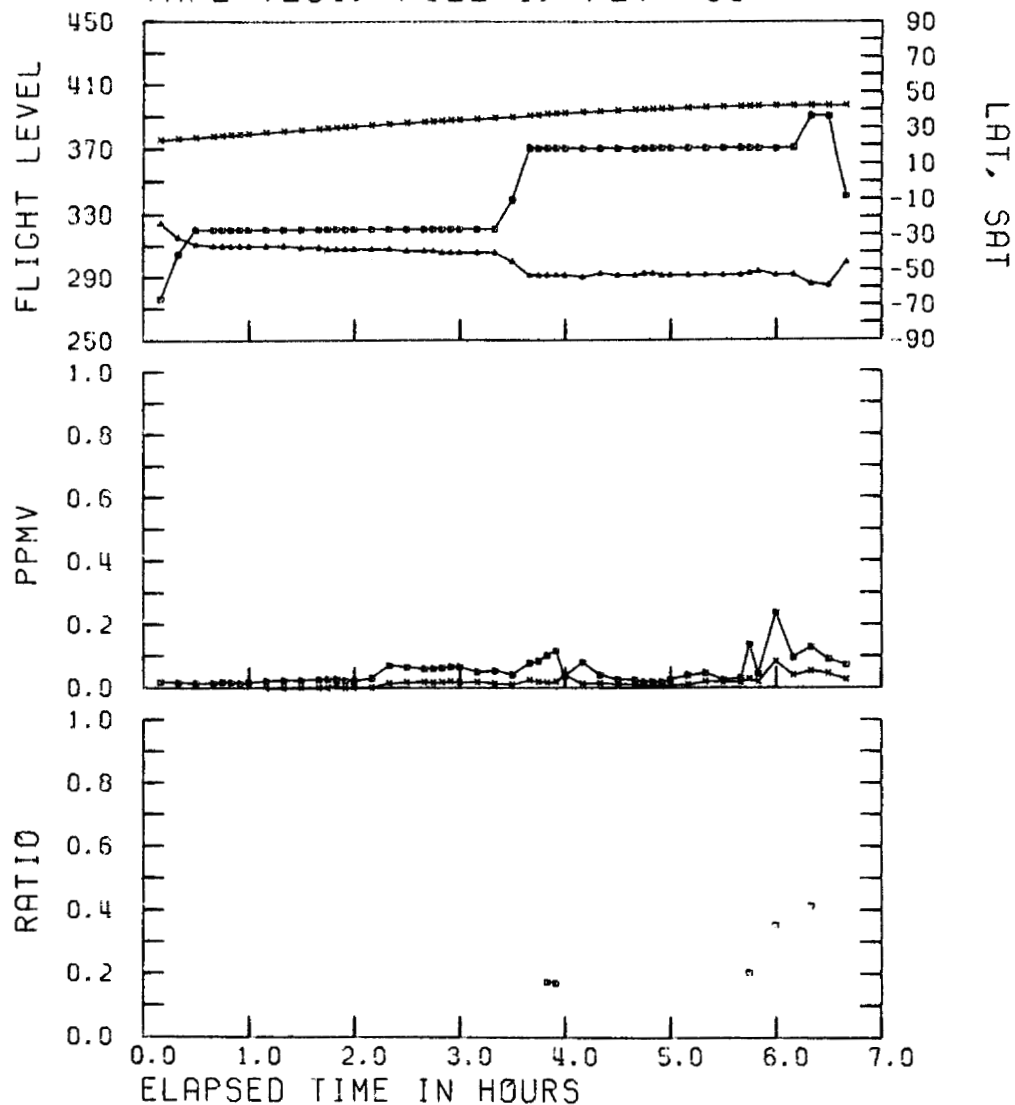
ORD TO HNL DEPARTURE 9 JUL 79
TAPE VL31, FILE 1, FLT 97



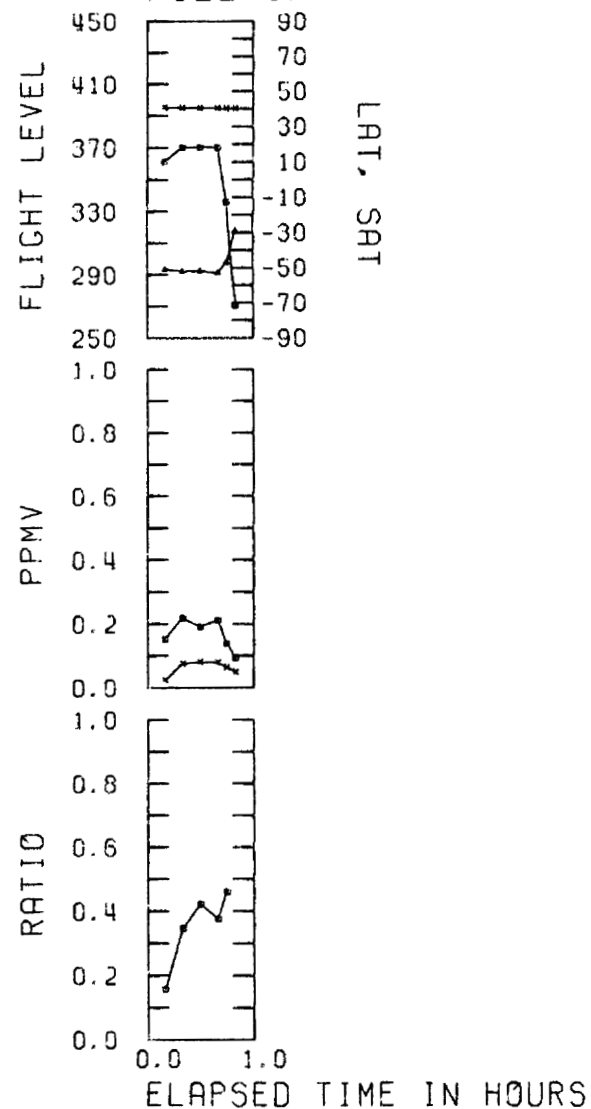
C-216

C-217

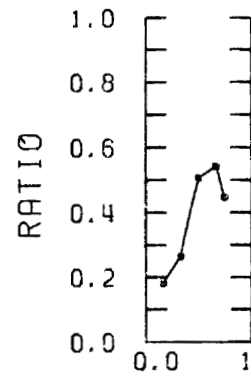
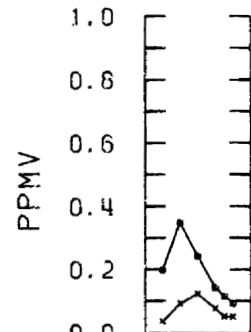
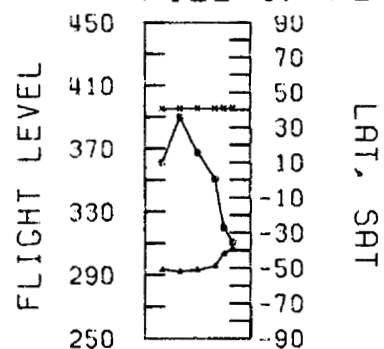
HNL TO ORD DEPARTURE 10 JUL 79
TAPE VL31, FILE 1, FLT 98



ORD TO PHL
DEPARTURE 10 JUL 79
TAPE VL31,
FILE 1, FLT 99

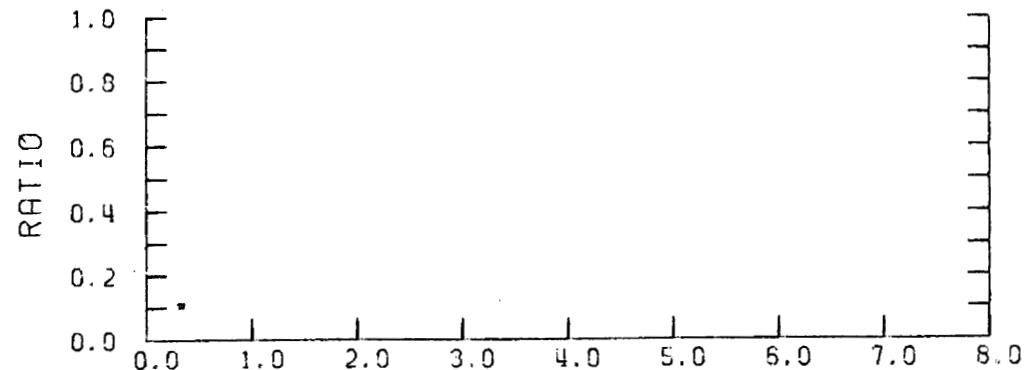
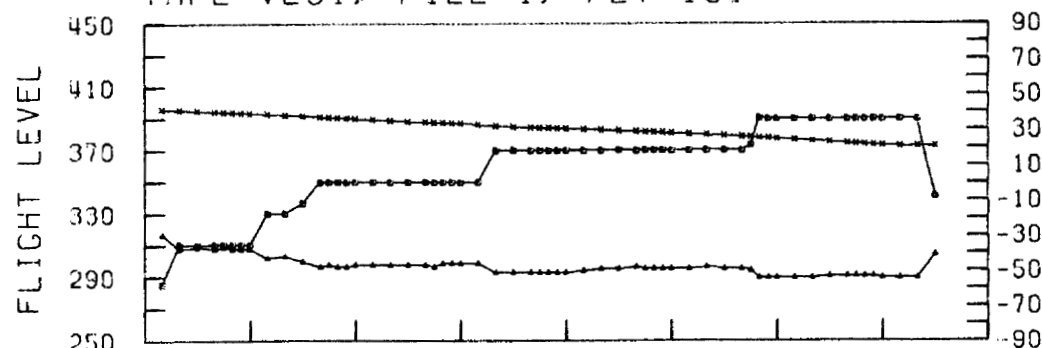


PHL TO ORD
DEPARTURE 10 JUL 79
TAPE VL31,
FILE 1, FLT 100



ELAPSED TIME IN HOURS

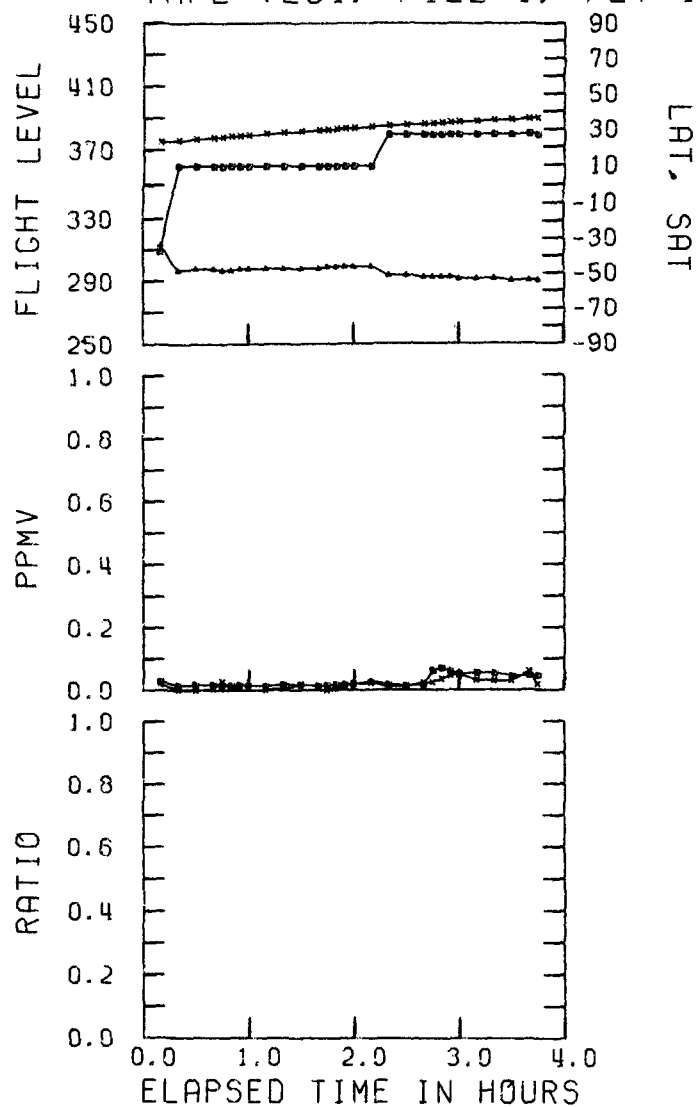
ORD TO HNL DEPARTURE 11 JUL 79
TAPE VL31, FILE 1, FLT 101



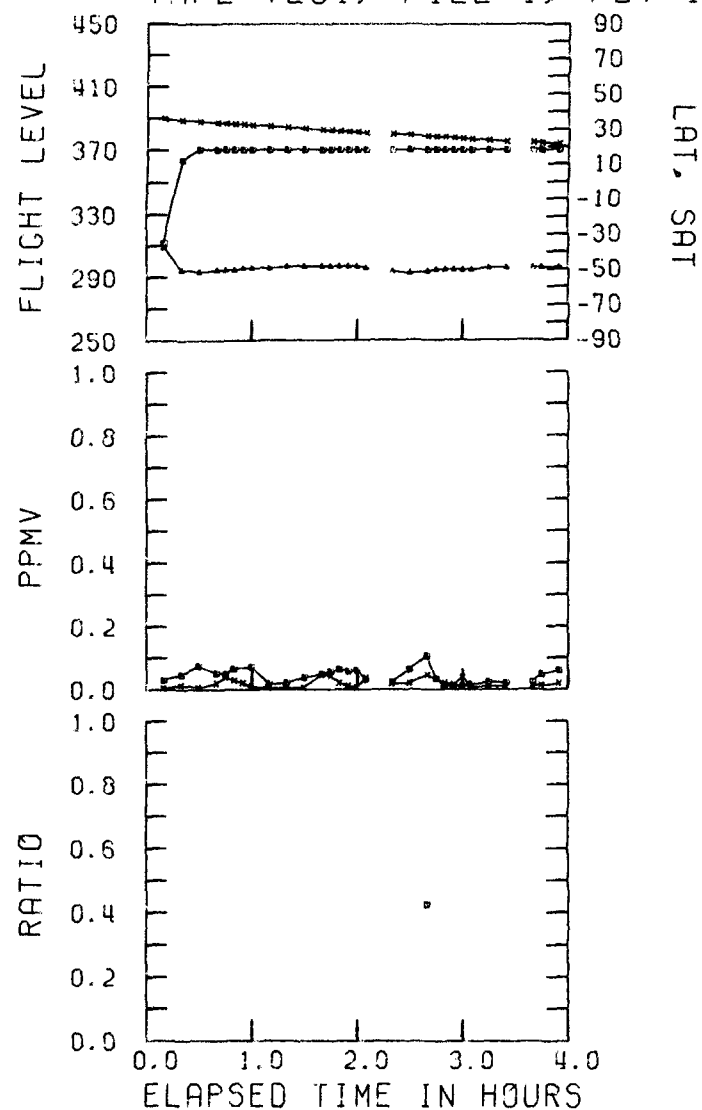
ELAPSED TIME IN HOURS

C-219

HNL TO SFO DEPARTURE 11 JUL 79
TAPE VL31, FILE 1, FLT 102

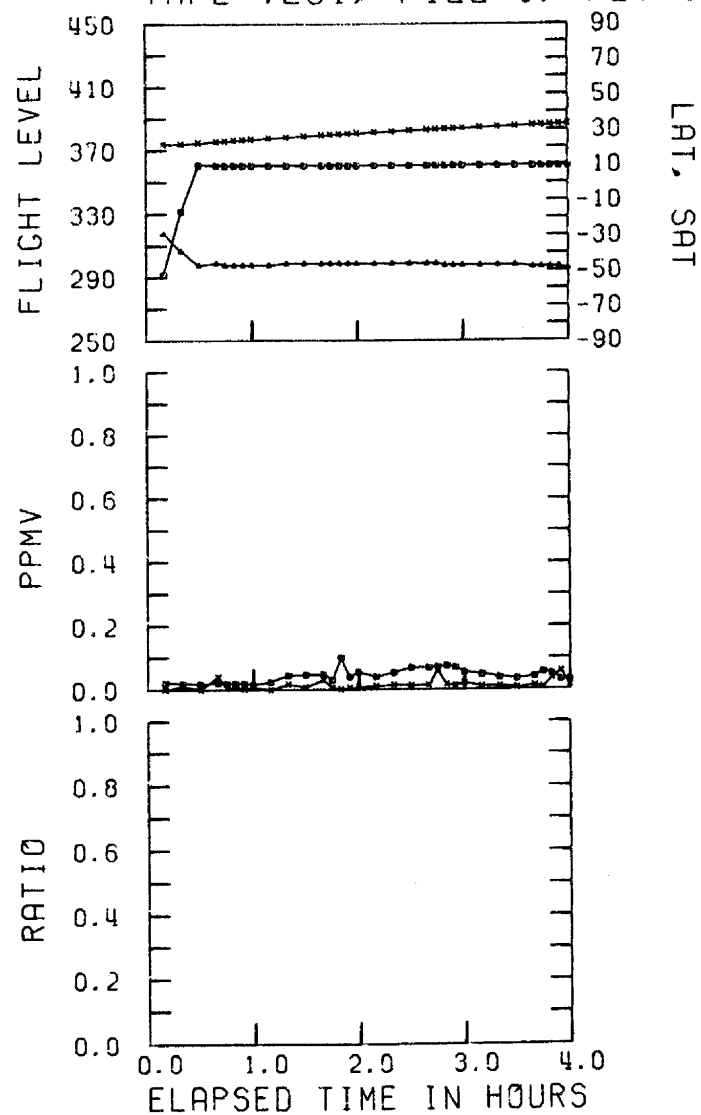


SFO TO HNL DEPARTURE 12 JUL 79
TAPE VL31, FILE 1, FLT 103

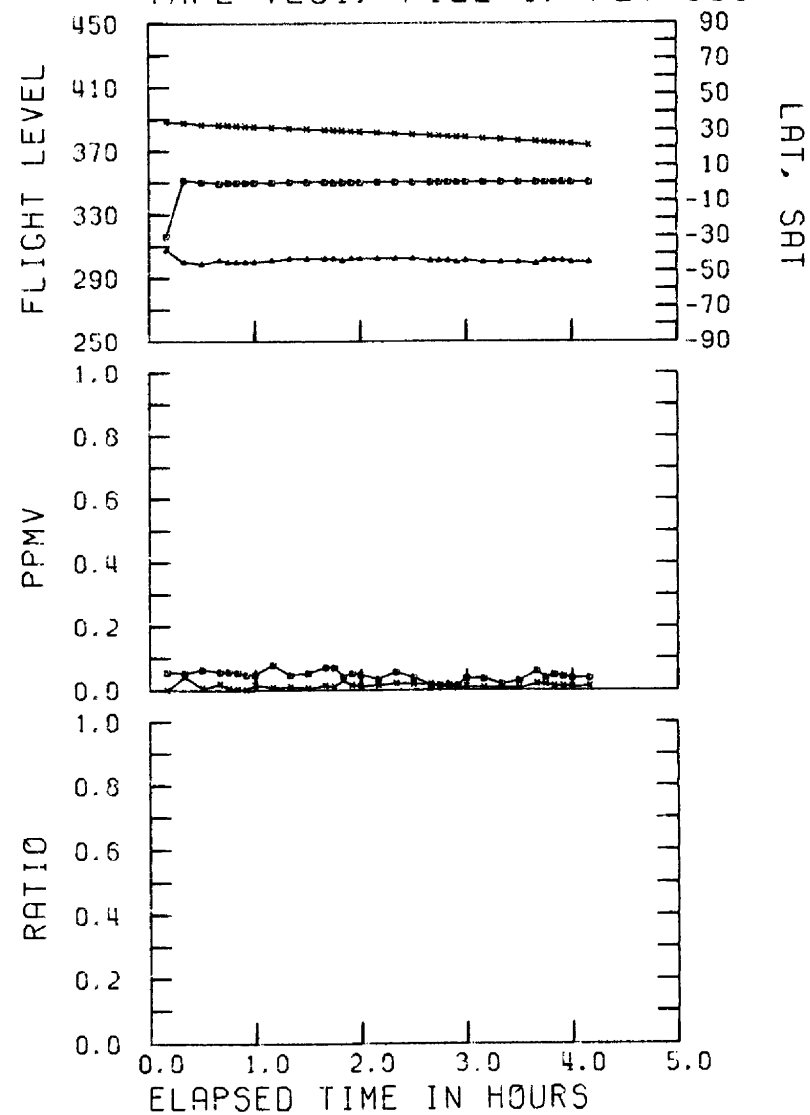


C-220

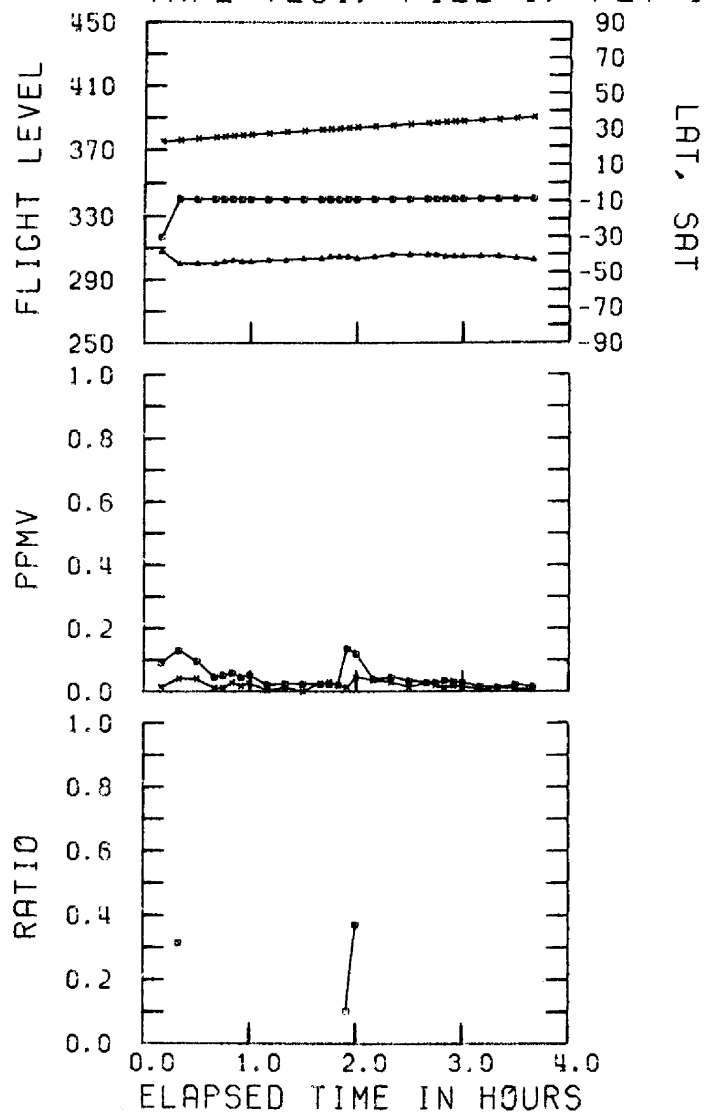
HNL TO LAX DEPARTURE 12 JUL 79
TAPE VL31, FILE 1, FLT 104



LAX TO HNL DEPARTURE 12 JUL 79
TAPE VL31, FILE 1, FLT 105



HNL TO SFO DEPARTURE 12 JUL 79
TAPE VL31, FILE 1, FLT 106



C-221

1. Report No. NASA TM-86883		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Simultaneous Cabin and Ambient Ozone Measurements on Two Boeing 747 Airplanes Volume III - October 1978 to July 1979				5. Report Date February 1985	
				6. Performing Organization Code 533-04-1A	
7. Author(s) James D. Holdeman and William H. Jasperson				8. Performing Organization Report No. E-2344	
				10. Work Unit No.	
9. Performing Organization Name and Address National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio 44135				11. Contract or Grant No.	
				13. Type of Report and Period Covered Technical Memorandum	
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D.C. 20546				14. Sponsoring Agency Code	
15. Supplementary Notes James D. Holdeman, NASA Lewis Research Center; William H. Jasperson, Control Data Corporation, Minneapolis, Minnesota. Work partly supported by FAA through interagency agreement DOT-FA78WAI-893.					
16. Abstract Measurements of ozone concentrations at cruise altitudes both outside and in the cabin of a Boeing 747SP and Boeing 747-100 airliners in routine commercial service are presented in this series of reports. Plotted and tabulated data are identified by route and are arranged chronologically for each airplane. These data were taken at 5- or 10-min intervals by automated instruments used in the NASA Global Atmospheric Sampling Program (GASP). All GASP cabin ozone data obtained from October 1978 to early July 1979 are presented in this volume.					
17. Key Words (Suggested by Author(s)) Ambient ozone; Aircraft measurements; cabin ozone; GASP				18. Distribution Statement Unclassified - unlimited STAR Category 47	
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of pages	
				22. Price*	